

# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

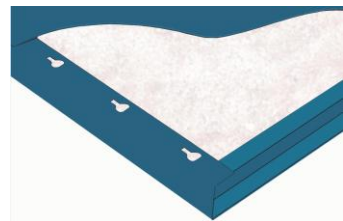
Owner of the Declaration	<b>ASSA ABLOY Door Group, LLC / Ceco Door ASSA ABLOY, INC.</b>
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ASA-20150073-IBA1-EN
Issue date	10.04.2015
Valid to	09.04.2020

**Legion / UltraDor Door**

**ASSA ABLOY Door Group, LLC / Ceco Door**

**ASSA ABLOY, INC.**

[www.bau-umwelt.com](http://www.bau-umwelt.com) / <https://epd-online.com>



## 1. General Information

### ASSA ABLOY Door Group, LLC

**Programme holder**

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

**Declaration number**

EPD-ASA-20150073-IBA1-EN

**This Declaration is based on the Product Category Rules:**

Windows and doors, 11.2014  
(PCR tested and approved by the independent expert committee (SVR))

**Issue date**

10.04.2015

**Valid to**

09.04.2020



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



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

### Legion / UltraDor Door

**Owner of the Declaration**

ASSA ABLOY  
Door and Perimeter Security Group  
Ceco Door  
9159 Telecom Drive  
38358 / Milan, TN USA

**Declared product / Declared unit**

This declaration represents 1 Legion/ UltraDor Polystyrene Core Steel Door prime painted.

**Scope:**

This declaration and its LCA study are relevant to Legion/ UltraDor Polystyrene Core 1 3/4" (4.445 cm) Steel doors manufactured from 14, 16, 18, 20 gauge cold rolled steel or optional 14, 16, 18, 20 gauge galvanized steel face sheets. All Legion/ UltraDor Polystyrene Core Steel Door component assembly and manufacturing processes are performed at our manufacturing factory - ASSA ABLOY Door and Perimeter Security Group - Ceco Door - Milan, TN, USA. The Legion/ UltraDor Polystyrene Core Steel Doors are marketed under ASSA ABLOY Door Group Ceco Door, Milan, TN, USA.

**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 SVR)

## 2. Product

### 2.1 Product description

Product name: Legion/ UltraDor Polystyrene Core Steel Door

Product characteristics: Legion / UltraDor doors are made full-flush or (optional) seamless style. Face sheets are commercial quality cold rolled steel or (optional) hot-dipped galvanized steel supplied by Nucor (Alabama). Legion full-flush doors have mechanically interlocked, hemmed, hairline seams on vertical edges and have no visible seams on faces. Doors specified "seamless" have no visible seams on faces or vertical edges. A one piece, polystyrene slab, conforming is bonded to the inside of both face sheets with a waterproof contact adhesive. The top and bottom door edges are closed with 16 gage steel channels welded to both face sheets.

### 2.2 Application

The Legion/ UltraDor Polystyrene Core Steel Doors can be used indoors or outdoors. Common applications are: Interior or Exterior door openings, Motels/Hotels, Office Buildings, Urban Renewal, Health Care, Institutional, Mercantile, School/Training Centers, Public Utility Stations, Warehouses/Factories, Manufacturing Plants,

Transportation Terminals, Vehicle Service Facilities, and Government Buildings.

### 2.3 Technical Data

Legion/ UltraDor Doors conform to the Steel Door Institute guide specification, ANSI A250.8 Recommended Specifications for Standard Steel Doors and Frames and ANSI / NAAMM / HMMA 867-06 Guide Specifications for Commercial Laminated Core Hollow Metal Doors and Frames; Available Sizes: 4'0" x 9'0" maximum single, 8'0" x 9'0" maximum pair.

The table below presents the technical properties of the product:

**Technical data**

Name	Value	Unit
Thermal Transmittance: (ASTM C1363) with Thermal Break frame	0.35	U-Factor
Thermal Transmittance: (ASTM C1363) with Thermal Break Frame	2.83	R-Value
Thermal Transmittance: (ASTM C1363) with Kerf frame	0.40	U-Factor

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Thermal Transmittance: (ASTM C1363) with Kerf Frame	2.50	R-Value
Physical endurance testing: Exceeds ANSI A250.4 performance test, level A (1,000,000 cycles) class 1 stiffness	1,000,000	cycles
Hurricane rating: Up to +/- 70 psf 4'0" x 8'0" single or +/- 70 psf 8'0" x 8'0" pair with weather kerf frame & cylindrical lock, mortise lock or rim exit device. ANSI A250.13, ASTM E330, ASTM E1886, ASTM E1996, TAS-201, TAS-202, TAS-203	4'0" x 8'0" Single +/- 70 8'0" x 8'0" pair +/-70	psf
Fire rating: Up to and including 3 hours 4'0" x 8'0" singles and 8'0"x 9'0" pairs, 8'0" x 9'0" with Vertical Rods 20 ga, 4'0" x 9'0" singles and 8'0" x 9'0" pairs 18 ga (UL10C, UL10B, UL1784) UL Agency Up to and including 4'0" x 8'0" singles and 8'0" x 8'0" pairs Warnock Hersey agency 180 minute max	UL & WH up to 180 min 4'0" x 8'0" singles and 8'0" x 9'0" pairs 20 ga, 4'0" x 9'0" singles and 8'0" x 9'0" pairs 18,16,14 ga	minute
Air Infiltration: CFM=cubic feet per minute, ASTM E283 operable tested with ASSA ABLOY Hardware, Sargent, Corbin Russwin, Yale, Pemko, McKinney	0.04	cfm/sqft
Air Infiltration: CFM=cubic feet per minute, ASTM E283 operable tested with ASSA ABLOY Hardware, Sargent, Corbin Russwin, Yale, Pemko, McKinney	0.06	cfm/lnft
Airborn Sound Transmission ASTM E90 and ASTM E413 – Sound Transmission Class (STC) F Design, 18 Ga Face Sheets, (Fully Operable) 4'0" x 8'0" maximum size	27	STC

**2.4 Placing on the market / Application rules**

- Legion/UltraDor doors conform to the Steel Door Institute guide specifications and ASTM / ANSI American Standards, Underwriters Lab and Warnock Hersey Agency:
- ASTM C1363-11 Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus
- ANSI /SDI A250.4-2011 Physical Endurance for Steel Doors, Frames & Frame Anchors Physical endurance testing
- ASTM E330 02 (2010) - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and

Curtain Walls by Uniform Static Air Pressure Difference

- ANSI/UL 10C Positive Pressure Fire Tests of Door Assemblies
- ASTM E90- Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- ASTM E283 Standard Test Method for Determining Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
- UFC 4-010-01, DoD Minimum Antiterrorism Standard for Buildings
- ASTM F2248 Standard Practice for Specifying an Equivalent 3-Second Duration Design Loading for Blast Resistant Glazing Fabricated with Laminated Glass
- ASTM F2247 Standard Test Method for Metal Doors Used in Blast Resistant Applications
- ASTM F1642 Standard Test Method for Glazing and Glazing Systems Subject to Airblast Loadings

**2.5 Delivery status**

Finished Legion/UltraDor doors are individually packed, stacked horizontally on cardboard pallet and banded to pallet for shipment. A minimum of 1 and max 20 doors per pallet is considered.

Package Sizes: Package dimensions are proportionate to the door size: e.g. 3'0" x 7'0" door pallet will be 3'0" x 7'0" x 44" (20 doors + 4" high pallet) 4'0" x 8'0" maximum width, 20 doors/pallet = 44" height.

**2.6 Base materials / Ancillary materials**

The composition of the steel door is as following:

Components	Percentage in mass (%)
Steel	96.76
Plastic	3.24
Total	100.0

**2.7 Manufacture**

Door production process utilizes cutting, forming, stamping, CNC, welding, grinding and electrostatic water based painting equipment. Door skins & components are fabricated from 20 ga, 18 ga, 16 ga and 14 ga cold rolled steel conforming to ASTM A1008 or hot-dipped galvanized steel conforming to ASTM A924 and A653. Top & Bottom door skins are mechanically interlocked and welded, hemmed vertical edge seams.one piece, polystyrene slab, conforming to ASTM C578 TYPE 1, is bonded to the inside of both face sheets with a waterproof contact adhesive. The top and bottom door edges are closed with 16 gage steel channels welded to both face sheets. Hardware Reinforcements for most lock preps, including concealed hardware, 7 gauge steel hinge reinforcements. Hinge preparations are handed. Hinge edges are mortised for 4-1/2" or 5"

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high, standard and heavy weight hinges. Paint: Electrostatically applied water based prime base coat per ANSI A250.10., Optional Colorstyle factory pre-finish per ANSI A250.3

All Legion/UltraDor Polystyrene Core Steel Door component assembly and manufacturing processes are performed at our manufacturing factory - ASSA ABLOY Door and Perimeter Security Group - Ceco Door - Milan, TN, USA.

**2.8 Environment and health during manufacturing**

ASSA ABLOY Door Group and Ceco are committed to protecting human health and the environment; meeting or exceeding Federal, State, and local laws, regulations, codes, and guidelines; and employing sustainable pollution prevention practices. Painting and Welding areas of the manufacturing plant has extraction ventilation system to remove the dust, VOC and air borne materials. Sound abatement is implemented where possible and Personal Protective Equipment is provided. Waste water is pre-treated prior to dispensing into city water system.

- Ceco's Legion/UltraDor Steel Doors are third party certified GREENGUARD Gold by UL Environmental
- 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 Environmental Management program effectiveness is evaluated.
- Code of Conduct covers human rights, labor practices and decent work. Management of ASSA ABLOY is aware of their roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance.

**2.9 Product processing / Installation**

Doors are typically installed into commercial applications per local, state and federal building codes, standards and requirements. Personal Protective Equipment should be provided at construction site.

**2.10 Packaging**

Legion / UltraDor Doors are individually wrapped in protective cardboard and banded with polyethylene to retain door protective packaging. The corrugated packaging is 100% recycled, Packaging material and polyethylene banding should be removed from packaging and collected separately for recycling. Cardboard pallet weighs 10 lbs (4.53 Kg) – we use 1 cardboard pallet for shipping 20 doors = 0.5 pounds (0.2267 Kg) per door  
Polypropylene (plastic) banding – each door has 3 bands of polypropylene weight is 0.8 ounces (22.67 grams) One pallet of 20 doors would have 16 ounces (453.592 grams) of polypropylene banding  
Cardboard door wrap (protective wrap) each door has 2 pounds (0.9071 Kg) per door, a pallet of 20 doors would have 40 pounds (18.14 Kg) of protective cardboard wrap.

Material	Value (%)
Cardboard/paper	97.70

**Water**

Plastic	2.30
Total	100.0

**2.11 Condition of use**

Doors are only prime painted, unless the Customer orders the doors factory finish painted. Doors receive an environmentally friendly primer finish designed to provide a rust inhibiting substrate and is intended as a preparatory base for field painting. The primer finish is not designed to be the final layer of protection from outside elements. Primed doors should receive a finish paint topcoat per S.D.I. / NAAMM / HMMA standards for performance. Gasketing and thresholds are used to control the flow of air, smoke, heat or cold, water, and sound through the door opening. The location or intended use of the door assembly, the environment to which it is exposed, and the performance expected will dictate the selection of gasketing and threshold products and the amount of maintenance required. Typical maintenance is to service the painted surface by re-coating the doors as necessary (location and environment will vary the time). This is usually after about 5 years in the field (but can be longer depending on exposure and environment). Repairs or replacement are not usually necessary. No cleaning efforts need to be taken into consideration.

**2.12 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. Ceco's Legion / UltraDor Steel Doors are third party certified GREENGUARD Gold by UL Environmental

**2.13 Reference service life**

Properly installed and maintained steel hollow metal doors have a service life of 30 years. Steel Door Institute test standard (ANSI/SDI A250.4- 2001) Level A requires 1,000,000 cycles; Level B requires 500,000 cycles, 18 ga, 16 ga and 14 ga Legion / UltraDor doors have cycle tested (open/closed) 1,000,000 cycles with no issues; 20 ga Legion / UltraDor doors have cycle tested (open/closed) 500,000 cycles with no issue. The location and intended use of the steel door assembly, the environment to which it is exposed, and the cycling of the door assembly will determine the steel door assembly life expectancy.

**2.14 Extraordinary effects**

**Fire Protection**

Fire Door Labeling Agency: UL, Intertek / Warnock Hersey and Factory Mutual  
Test: UL10C, UL10B NFPA 252  
Rating: UL 20 min. to 3 Hours Max size: 4'0" x 9'0" single, Max size 8'0" x 9'0" Pair WH 20 min. to 1 1/2 hour Max size: 4'0" x 8'0" single. UL & WH up to 180 min 4'0" x 8'0" singles and 8'0" x 9'0" pairs 20 ga,  
4'0" x 9'0" singles and 8'0" x 9'0" pairs 18,16,14 ga

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No substances are used which have a negative impact on ecological water quality on contact by the door with water. Steel doors subjected to unforeseeable flooding conditions will increase the potential for developing surface rust. The door is designed for traditional locations and is not intended for flood protection.

**Mechanical destruction**

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

**2.15 Re-use phase**

The product is possible to reuse during the reference service life and be moved from one similar door opening to another. The majority, by weight, of door components is steel which can be recycled. In collaboration with the Steel Recycling Institute, customers can utilize a locator tool, allowing them to find a recycling center near them. The locator tool is hosted on the Steel Recycling Institute's website

([www.recycle-steel.org](http://www.recycle-steel.org)); it simply asks the user for location information, and provides the nearest recycling location. The tool is free to use and allows the consumer to travel just a short distance and properly dispose their materials. This free program provides recycling and/or disposal of door and frame products that have reached the end of their life cycle and are beyond the product's warranty period.

**2.16 Disposal**

No disposal is foreseen for the Legion Door nor for the corresponding packaging.

**2.17 Further information**

For additional information on our products please visit our web sites:

**ASSA ABLOY** [www.assaabloydss.com](http://www.assaabloydss.com), or **Ceco Door** [www.cecodoor.com](http://www.cecodoor.com)

### 3. LCA: Calculation rules

#### 3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of Legion door as specified in Part B requirements on the EPD for Windows and doors/IBU PCR Part B/.

##### Declared unit

Name	Value	Unit
Declared unit	1	piece of Legion door
Conversion factor to 1 kg	0.02	
Area	1.95	sqm/pc
Ratio to reference door	0.728	Measuring 1.23 m x 2,18 m = 2,68 sqm/pc (reference door based on EN14351-1)

#### 3.2 System boundary

Type of the EPD: cradle to gate - with Options  
The following life cycle phases were considered for Legion door:

A1-A3 Production stage:

- A1 – Raw material extraction and processing
- A2 – Transport to the manufacturer and
- A3 – Manufacturing.

A4-A5 Construction stage:

- A4 - Transport from the gate to the site
- A5 – Packaging waste processing

End-of-life stage:

- C2 – Transport to waste processing,
- C3 – Waste processing
- C4 – Disposal (landfill)

These information modules include provision and transport of all materials, products, as well as energy and water provisions, 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

Transport:

For materials and pre-products the actual means of transport and distances, provided by the suppliers, were considered

EoL:

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

#### 3.4 Cut-off criteria

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

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

#### 3.5 Background data

For life cycle modeling of the considered products, the GaBi 6 Software System for Life Cycle Engineering, developed by PE INTERNATIONAL AG, is used /GaBi 6 2013/. The GaBi-database contains consistent and documented datasets which are documented in the online GaBi-documentation /GaBi 6 2013D/.

To ensure comparability of results in the LCA, the basic data of GaBi database were used for energy, transportation and auxiliary materials.

#### 3.6 Data quality

The requirements for data quality and background data correspond to the specifications of the /IBU PCR PART A/.

PE INTERNATIONAL performed a variety of tests and validations during the commission of the present study in order to ensure its quality of the present document and results. 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 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

In the EPD scenarios and/or technical information for Modules A5, C1-C4 and D are given.

**Installation into the building (A5)**

Name	Value	Unit
Output substances following waste treatment on site (Plastics packaging)	0.027	kg
Output substances following waste treatment on site (Paper packaging)	1.134	kg

**Reference service life**

Name	Value	Unit
Reference service life	30	a

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

Name	Value	Unit
Collected separately Steel	43.30	kg
Collected separately Plastics	1.45	kg
Recycling Steel	43.30	kg
Thermal treatment Plastics	1.45	kg

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

Name	Value	Unit
Collected separately waste type Legion door (including packaging)	45.91	kg
Recycling Steel recycling	94.31	%
Reuse Packaging (paper + plastic) (from A5)	2.53	%
Thermal Treatment Plastics	3.16	%

## 5. LCA: Results

Results shown below were calculated using CML 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 BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement <sup>(1)</sup>	Refurbishment <sup>(1)</sup>	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	MND	MND	MND	X	X	X	X	

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 piece of Legion Door

Parameter	Unit	A1 - A3	A4	A5	C2	C3	C4	D
Global warming potential	[kg CO <sub>2</sub> -Eq.]	1.14E+02	1.69E+00	1.67E+00	8.19E-01	0.00E+00	3.62E+00	-7.11E+01
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	7.61E-09	8.10E-12	7.55E-12	3.92E-12	0.00E+00	1.09E-11	-3.08E-10
Acidification potential of land and water	[kg SO <sub>2</sub> -Eq.]	4.16E-01	7.74E-03	3.83E-04	3.75E-03	0.00E+00	9.23E-04	-2.66E-01
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3-</sup> -Eq.]	3.51E-02	1.77E-03	6.52E-05	8.56E-04	0.00E+00	6.99E-05	-2.21E-02
Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	5.32E-02	-2.50E-03	2.68E-05	-1.21E-03	0.00E+00	4.48E-05	-3.96E-02
Abiotic depletion potential for non fossil resources	[kg Sb Eq.]	1.39E-05	6.38E-08	3.34E-08	3.09E-08	0.00E+00	2.39E-07	-1.57E-06
Abiotic depletion potential for fossil resources	[MJ]	1.37E+03	2.33E+01	4.78E-01	1.13E+01	0.00E+00	1.53E+00	-6.71E+02

### RESULTS OF THE LCA - RESOURCE USE: 1 piece of Legion Door

Parameter	Unit	A1 - A3	A4	A5	C2	C3	C4	D
Renewable primary energy as energy carrier	[MJ]	8.44E+01	-	-	-	-	-	-
Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-
Total use of renewable primary energy resources	[MJ]	8.44E+01	9.20E-01	4.40E-02	4.45E-01	0.00E+00	1.12E-01	8.89E+00
Non renewable primary energy as energy carrier	[MJ]	1.46E+03	-	-	-	-	-	-
Non renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-
Total use of non renewable primary energy resources	[MJ]	1.46E+03	2.34E+01	5.59E-01	1.13E+01	0.00E+00	1.70E+00	-6.38E+02
Use of secondary material	[kg]	6.33E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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
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
Use of net fresh water	[m <sup>3</sup> ]	5.21E-01	6.49E-04	4.84E-03	3.14E-04	0.00E+00	8.85E-03	-4.60E-02

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

#### 1 piece of Legion Door

Parameter	Unit	A1-3	A4	A5	C2	C3	C4	D
Hazardous waste disposed	[kg]	1.65E-02	5.33E-05	3.84E-05	2.58E-05	0.00E+00	1.19E-04	4.38E-02
Non hazardous waste disposed	[kg]	1.35E+00	2.95E-03	4.66E-02	1.43E-03	0.00E+00	3.38E-01	-9.94E-01
Radioactive waste disposed	[kg]	3.22E-02	3.07E-05	3.21E-05	1.48E-05	0.00E+00	6.79E-05	1.31E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
Materials for recycling	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.44E+01	0.00E+00	-
Materials for energy recovery	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
Exported electrical energy	[MJ]	0.00E+00	0.00E+00	2.16E+00	0.00E+00	0.00E+00	6.93E+00	-
Exported thermal energy	[MJ]	0.00E+00	0.00E+00	6.08E+00	0.00E+00	0.00E+00	1.90E+01	-

## 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 93% and 100% to total impact assessment. This stage is dominated by upstream emissions associated with steel manufacturing processes. The environmental

impacts for the transport (A2) have a negligible impact within this stage.

In module D the benefits (negative values) and loads beyond the system boundary are declared for the recycling potential of the metals and for the credits from the incineration process (energy substitution) within A5.



## 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.,  
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. April 2013  
www.bau-umwelt.de

### IBU PCR Part B

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 Windows and doors.  
www.bau-umwelt.com

### ANSI / SDI A250.4-2011

ANSI /SDI A250.4-2011: Physical Endurance for Steel  
Doors, Frames & Frame Anchors Physical endurance  
testing

### ASTM A250.13

ASTM A250.13: Testing and Rating of Severe  
Windstorm Resistant Components for Swinging Door  
Assemblies

### ASTM C1363-11

ASTM C1363-11: Standard Test Method for Thermal  
Performance of Building Materials and Envelope  
Assemblies by Means of a Hot Box Apparatus

### ASTM E90-09

ASTM E90-09: Standard Test Method for Laboratory  
Measurement of Airborne Sound Transmission Loss of  
Building Partitions and Elements

### ASTM E283

ASTM E283: Standard Test Method for Determining  
Rate of Air Leakage through Exterior Windows, Curtain  
Walls, and Doors Under Specified Pressure  
Differences Across the Specimen

### ASTM E330 02

ASTM E330 02 (2010): Standard Test Method for  
Structural Performance of Exterior Windows, Doors,  
Skylights and Curtain Walls by Uniform Static Air  
Pressure Difference

### ASTM E413 – 10

ASTM E413 – 10: Classification for Rating Sound  
Insulation

### ASTM E1886-13a

ASTM E1886-13a: Standard Test Method for  
Performance of Exterior Windows, Curtain Walls,  
Doors, and Impact Protective Systems Impacted by  
Missiles; and Exposed to Cyclic Pressure Differentials

### ASTM E1996-12

ASTM E1996-12: Standard Specification for  
Performance of Exterior Windows, Curtain Walls,  
Doors, and Impact Protective Systems Impacted by  
Windborne Debris in Hurricanes

### ASTM F1642

ASTM F1642: Standard Test Method for Glazing and  
Glazing Systems Subject to Airblast Loadings

### ASTM F2247

ASTM F2247: Standard Test Method for Metal Doors  
Used in Blast Resistant Applications

### ASTM F2248

ASTM F2248: Standard Practice for Specifying an  
Equivalent 3-Second Duration Design Loading for  
Blast Resistant Glazing Fabricated with Laminated  
Glass

### CEN/TR 15941

CEN/TR 15941: 2010-11 Sustainability of construction  
works - Environmental product declarations -  
Methodology for selection and use of generic data

### DIN EN ISO 14025

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

### DoD UFC 4-010-01

DoD UFC 4-010-01: Minimum Antiterrorism Standards  
for Buildings (Department of Defense Unified Facilities  
Criteria)

### EN ISO 14040

EN ISO 14040: 2006, Environmental management -  
Life cycle assessment - Principles and framework

### EN ISO 14044

EN ISO 14044: 2006 Environmental management -  
Life cycle assessment - Requirements and guidelines

### EN 15804

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

**ASSA ABLOY****GaBi 6 2013**

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

**GaBi 6 2013D**

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

**NFPA 252**

NFPA 252: Standard methods of fire tests of door assemblies

**TAS-201**

TAS-201: Large and Small Missile Test Standards, Florida Building Code

**TAS-202**

TAS-202: Uniform Structural Load Standards, Florida Building Code

**TAS-203**

TAS-203: Uniform Cyclic Pressure Test Standards, Florida Building Code

**UL 10C**

UL 10c: Positive Pressure Fire Tests of Door Assemblies

## 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 BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement <sup>(1)</sup>	Refurbishment <sup>(1)</sup>	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	MND	MND	MND	X	X	X	X	

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 piece of Legion Door

Parameter	Parameter	Unit	A1-3	A4	A5	C2	C3	C4	D
GWP	Global warming potential	[kg CO <sub>2</sub> -Eq.]	1.14E+02	1.69E+00	1.67E+00	8.19E-01	0.00E+00	3.62E+00	-7.11E+01
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	8.09E-09	8.61E-12	8.03E-12	4.17E-12	0.00E+00	1.16E-11	-3.29E-10
AP	Acidification potential of land and water	[kg SO <sub>2</sub> -Eq.]	4.19E-01	1.01E-02	4.63E-04	4.90E-03	0.00E+00	1.08E-03	-2.70E-01
EP	Eutrophication potential	[kg N-eq.]	2.25E-02	7.11E-04	2.56E-05	3.44E-04	0.00E+00	3.09E-05	-1.32E-02
Smog	Ground-level smog formation potential	[kg O <sub>3</sub> -eq.]	5.89E+00	2.08E-01	1.05E-02	1.01E-01	0.00E+00	8.51E-03	-3.99E+00
Resources		[MJ]	5.56E+01	3.36E+00	5.57E-02	1.62E+00	0.00E+00	1.58E-01	4.60E+00

### RESULTS OF THE LCA - RESOURCE USE: 1 piece of Legion Door

Parameter	Parameter	Unit	A1-3	A4	A5	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	8.44E+01	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	8.44E+01	9.20E-01	4.40E-02	4.45E-01	0.00E+00	1.12E-01	8.89E+00
PENRE	Non renewable primary energy as energy carrier	[MJ]	1.46E+03	-	-	-	-	-	-
PENRM	Non renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-
PENRT	Total use of non renewable primary energy resources	[MJ]	1.46E+03	2.34E+01	5.59E-01	1.13E+01	0.00E+00	1.70E+00	-6.38E+02
SM	Use of secondary material	[kg]	6.33E+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
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
FW	Use of net fresh water	[m <sup>3</sup> ]	5.21E-01	6.49E-04	4.84E-03	3.14E-04	0.00E+00	8.85E-03	-4.60E-02

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

#### 1 piece of Legion Door

Parameter	Parameter	Unit	A1-3	A4	A5	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	1.65E-02	5.33E-05	3.84E-05	2.58E-05	0.00E+00	1.19E-04	4.38E-02
NHWD	Non hazardous waste disposed	[kg]	1.35E+00	2.95E-03	4.66E-02	1.43E-03	0.00E+00	3.38E-01	-9.94E-01
RWD	Radioactive waste disposed	[kg]	3.22E-02	3.07E-05	3.21E-05	1.48E-05	0.00E+00	6.79E-05	1.31E-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	-
MFR	Materials for recycling	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.44E+01	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	-
EEE	Exported electrical energy	[MJ]	0.00E+00	0.00E+00	2.16E+00	0.00E+00	0.00E+00	6.93E+00	-
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	6.08E+00	0.00E+00	0.00E+00	1.90E+01	-

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