ENVIRONMENTAL PRODUCT DECLARATION

TRIO-E STEEL STIFFENED DOOR

ASSA ABLOY DOOR GROUP
FLEMING DOOR PRODUCTS

ASSA ABLOY is committed to providing products and services that are environmentally sound throughout the entire production process and the product lifecycle. Our unconditional aim is to make sustainability a central part of our business philosophy and culture, but even more important is the job of integrating sustainability into our business strategy. The employment of EPDs will help architects, designers and LEED-APs select environmentally preferable door openings. The Trio-E EPD provides detailed requirements with which to evaluate the environmental and human health impacts related to producing our door openings. ASSA ABLOY will continue our efforts to protect the environment and health of our customers/end users and will utilize the EPD as one means to document those efforts.
This declaration is an environmental product declaration (EPD) in accordance with ISO 14025. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. Accuracy of Results: EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.

<table>
<thead>
<tr>
<th>PROGRAM OPERATOR</th>
<th>UL Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>DECLARATION HOLDER</td>
<td>Fleming Door Products</td>
</tr>
<tr>
<td>ULE DECLARATION NUMBER</td>
<td>4786545067.103.1</td>
</tr>
<tr>
<td>IBU DECLARATION NUMBER</td>
<td>EPD-ASA-20130284-IBC1-EN</td>
</tr>
<tr>
<td>DECLARED PRODUCT</td>
<td>Trio-E Steel Stiffened Door</td>
</tr>
</tbody>
</table>

**REFERENCE PCR**

**DATE OF ISSUE**
February 21, 2014

**PERIOD OF VALIDITY**
5 years

**SCOPE**
This EPD is Manufacturer Declaration (1a) – Declaration of a specific product from a manufacturer’s plant. The owner of the declaration shall be liable for the underlying information and evidence.

**CONTENTS OF THE DECLARATION**
- Product definition
- Information about basic material and the material’s origin
- Description of the product’s manufacture
- Indication of product processing
- Life cycle assessment results
- Testing results and verifications

The PCR review was conducted by: The independent expert committee

The CEN Norm EN 15804 serves as the core PCR. This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories

☐ INTERNAL ☒ EXTERNAL

This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:

Anna Nicholson

IBU - Institut Bauen und Umwelt e.V.
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-20130284-IBC1-EN

This Declaration is based on the Product Category Rules:
Windows and doors, 10-2012
(PCR tested and approved by the independent expert committee)

Issue date
21.02.2014

Valid to
20.02.2019

Trio-E Steel Stiffened Door

Owner of the Declaration
Fleming Door Products
Ashbridge Circle 101
L4L3R5 Woodbridge, Ontario
USA

Declared product / Declared unit
This declaration represents 1 TrioE Steel Stiffened Door prime painted.

Scope:
This declaration and its LCA study are relevant to TrioE steel stiffened polyurethane foam in place core 1 3/4" (4.445 cm) hollow metal doors manufactured from 18 gauge cold rolled steel or optional 16 gauge galvanized steel face sheets at a single manufacturing ASSA ABLOY Door Group site - Ceco Door, Milan, TN, USA. All TrioE door component assembly and manufacturing processes are performed at our manufacturing factory - Ceco Door - Milan, TN, USA. The TrioE doors are marketed under the following ASSA ABLOY Door Group brands: Fleming Door Products (Woodbridge, Ontario, CN). The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Verification
The CEN Norm EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025

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

Dr. Burkhart Lehmann
(Managing Director IBU)

2. Product

2.1 Product description
Trio-E steel stiffened door is for exterior commercial applications where green factors, strength, sustainability and aesthetics all play a role. The Trio-E door is part of a complete door opening, utilizing thermal break or kerf frames and PEMKO thermal barrier saddles, to offer operable U-Factor (0.29), while maintaining the strength to withstand winds up to 100 psi. The door is manufactured without any visible weld marks, to achieve a beautiful energy efficient opening.

2.2 Application
The Trio-E can be used indoors or outdoors. Common applications are: interior or exterior door openings, motels/hotels, office buildings, urban renewal, health care, institutional, data processing, mercantile, food processing, school/training centers, public utility stations, warehouses/factories, manufacturing plants, transportation terminals, vehicle service facilities and government buildings.

2.3 Technical Data
TRIO-E 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 8’0” maximum single, 8’0” x 8’0” maximum pair.

The table below presents the technical properties of the product:

<table>
<thead>
<tr>
<th>Constructional data</th>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thermal Transmittance: (/ASTM C1363/)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>with Thermal Break Frame</td>
<td>0.29</td>
<td>U-Factor</td>
</tr>
<tr>
<td></td>
<td>Thermal Transmittance: (/ASTM C1363/)</td>
<td>3.4</td>
<td>R-Value</td>
</tr>
<tr>
<td></td>
<td>with Thermal Break Frame</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thermal Transmittance: (/ASTM C1363/)</td>
<td>0.36</td>
<td>U-Factor</td>
</tr>
<tr>
<td></td>
<td>with kerf frame</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thermal Transmittance: (/ASTM C1363/)</td>
<td>2.7</td>
<td>R-Value</td>
</tr>
</tbody>
</table>
2.4 Placing on the market / Application rules

TrioE doors conform to the Steel Door Institute guide specifications and ASTM / ANSI American Standards, Underwriters Lab and Warnock Hersey Agency:

- /ANSI /SDI A250.4-2011/ Physical Endurance for Steel Doors, Frames & Frame Anchors Physical endurance testing
- /ANSI/UL 10C/ Positive Pressure Fire Tests of Door Assemblies

- /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 TrioE doors are individually packaged then placed horizontally on cardboard pallet and banded to pallet for shipment. Minimum of 1 and max 20 doors per pallet. Package sizes are proportionate to the door size: e.g. 30" x 70" door will be 30" x 70" 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 (excluding packaging) is as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage in mass (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel face sheet / components - CRS</td>
<td>95</td>
</tr>
<tr>
<td>PU core</td>
<td>2</td>
</tr>
<tr>
<td>Others (primer, foam)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

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 18 ga or 16 ga cold rolled steel conforming to /ASTM A1008/ or hot-dipped galvanized steel conforming to /ASTM A924/ and /ASTM A653/. Top & Bottom door skins are mechanically interlocked and welded, hemmed vertical edge seams. 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" high, standard and heavy weight hinges. Core: 22 gauge steel stiffeners welded spaced every 6" apart with injected polyurethane foam in place core. Paint: Electrostatically applied water based prime base coat per /ANSI A250.10/. Optional color style factory finish per /ANSI A250.3/. Stiffened Door

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 manufacturing plant have extraction ventilation system to remove dust, volatile organic compounds (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. A large portion of power supply available on the grid to the plant is generated from nearby TVA hydroelectric generation. (TV A dam systems)

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.

2.13 Reference service life

Properly installed and maintained steel hollow metal doors often last 30 years or longer. Steel Door Institute test standard /ANSI/SDI A250.4 - 2001/ Level A requires 1,000,000 cycles - TrioE doors have cycle tested (open/closed) 4,800,000 cycles with no issues. 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

Fire Protection

Fire Door Labelling Agency: UL and Warnock Hersey Test: /UL10C, UL10B NFPA 252/
Rating: UL 20 min. to 3 Hours Max size: 4’0” x 8’0” single, Max size 8’0” x 8’0” Pair WH 20 min. to 1 1/2 hour Max size: 4’0” x 8’0” single.

Water

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 impact on human health and environment is known or expected. Especially no hazardous substance can be anticipated in case of a mechanical destruction.

2.15 Re-use phase

It is possible to re-use the product during the reference service life and it can be moved from one similar door opening to another. The major material, by weight, in door components is steel which can be recycled.

2.16 Disposal

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); 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 to properly dispose of 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. /European Waste Catalogue Code: 15 01 01 Paper and Cardboard Packaging/, /15 -1 -3 Wooden Packaging/, /17 02 02 Glass/, /17 04 05 Steel/, /20 01 02 Glass/, /20 01 40 Metal/. See: LCA, PCR.

2.17 Further information

For additional information on our products, please visit our web sites: ASSA ABLOY www.assaabloy.com, or Fleming Door Products www.flemingdoor.com

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

TrioE Doors are individually wrapped in protective cardboard and banded with polyethylene to retain door protective packaging. Doors are stacked horizontally on cardboard pallet and banded to pallet for shipment. (max 20 doors per pallet) Corrugated packaging is 100% recycled, packaging material and polyethylene banding should be removed from packaging and collected separately for recycling.

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.
3. LCA: Calculation rules

3.1 Declared Unit
The declaration refers to the functional unit of 1 piece of Trio-E steel door as specified in Part B requirements on the EPD for Windows and doors/IBU PCR Part B.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declared unit</td>
<td>1</td>
<td>piece of Trio-E steel door</td>
</tr>
<tr>
<td>Mass (total system)</td>
<td>53.5</td>
<td>kg</td>
</tr>
<tr>
<td>Conversion factor to 1 kg</td>
<td>0.02</td>
<td>sqm/pc</td>
</tr>
<tr>
<td>Area</td>
<td>1.95</td>
<td>sqm/pc</td>
</tr>
<tr>
<td>Ratio to reference door</td>
<td>0.728</td>
<td></td>
</tr>
</tbody>
</table>

3.2 System boundary
Type of the EPD: cradle to gate - with options
The following life cycle phases were considered for Trio-E steel door:

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

A4-A5 Construction phase:
- A5 – Packaging waste processing

The use phase:
- B2 - Maintenance (surface treatment by re-coating / re-painting).

End-of-life phase:
- C2 – Transport to 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 status or disposal of final residues.

Module D:
- Declaration of all benefits or recycling potential from EOL and A5

3.3 Estimates and assumptions
Transport:
Real-world data on mode of transport and distances, as reported by suppliers, was used for materials contributing more than 2% to the total product mass.

For parts and materials, contributing less than 2% to the total product mass, road transport over an average distance of 500km was assumed.

EOL:
In the End-of-Life phase a recycling scenario with 100% collection rate was assumed.

3.4 Cut-off criteria
In the assessment, all available data from production process were 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).

For raw materials, contributing more than 2% to the total product mass, means of transportation and distances were modeled in more detail to better reflect the reality; for materials or product parts, contributing less than 2% of total product mass, average distances and standard means of transport were assumed.

The overall contribution derived from these assumptions does not exceed 5% to the impact categories under consideration. Impacts relating to the production of machines and facilities required during production are out of the scope of this assessment.

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

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

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

PE INTERNATIONAL performed a variety of tests and checks during the entire project to ensure high quality of the completed project. This obviously includes an extensive review of project-specific LCA models as well as the background data used. The technological background of the collected data reflects the physical reality of the declared products. The datasets are complete and conform to the system boundaries and the criteria for the exclusion of inputs and outputs.

All relevant background datasets are taken from the /GaBi 6/ software database. The last revision of the used background data has taken place not longer than 10 years ago.

3.7 Period under review
The period under review is 2012/13 (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 from packaging
- Waste incineration of paper from packaging

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 each background dataset is available in the corresponding 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 B2, B6, C1-C4 and D are given.

Maintenance (B2)

The typical maintenance is to service the painted surface by re-coating / re-painting the doors as necessary (location and environment will vary the time). This is usually after about 5 years in the field.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance cycle</td>
<td>1</td>
<td>each 5 year</td>
</tr>
<tr>
<td>Solvent paint</td>
<td>1.28</td>
<td>kg/door*re-coating</td>
</tr>
</tbody>
</table>

Reference service life

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference service life</td>
<td>30</td>
<td>a</td>
</tr>
</tbody>
</table>

End of life (C1-C4)

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collected separately steel</td>
<td>49.2</td>
<td>kg</td>
</tr>
<tr>
<td>Collected as mixed construction waste</td>
<td>3.2</td>
<td>kg</td>
</tr>
<tr>
<td>Recycling steel</td>
<td>49.2</td>
<td>kg</td>
</tr>
<tr>
<td>Landfilling</td>
<td>3.2</td>
<td>kg</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collected separately waste type steel door Trio-E (including packaging)</td>
<td>53.5</td>
<td>kg</td>
</tr>
<tr>
<td>Recycling steel recycling</td>
<td>92</td>
<td>%</td>
</tr>
<tr>
<td>Reuse packaging (paper + plastic) from A5</td>
<td>2</td>
<td>%</td>
</tr>
<tr>
<td>Construction waste going to landfill</td>
<td>6</td>
<td>%</td>
</tr>
</tbody>
</table>
5. LCA: Results

The Table below shows the LCA results for the declared unit - 1 piece of Trio-E steel stiffened door.

**DESCRIPTION OF THE SYSTEM BOUNDARY**

<table>
<thead>
<tr>
<th>PRODUCT STAGE</th>
<th>CONSTRUCTION STAGE</th>
<th>USE STAGE</th>
<th>END OF LIFE STAGE</th>
<th>BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw material</td>
<td>Supply</td>
<td>Transport</td>
<td>Manufacturing</td>
<td>Assembly</td>
</tr>
<tr>
<td>Transport</td>
<td>A1</td>
<td>B1</td>
<td>A2</td>
<td>Maintenance</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>A3</td>
<td>B2</td>
<td>A4</td>
<td>Use</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>A5</td>
<td>B3</td>
<td>B1</td>
<td>Repair</td>
</tr>
<tr>
<td>Transport</td>
<td>A1</td>
<td>B4</td>
<td>A5</td>
<td>Replacement</td>
</tr>
<tr>
<td>Transport</td>
<td>A1</td>
<td>B5</td>
<td>B6</td>
<td>Re-treatment</td>
</tr>
<tr>
<td>Use</td>
<td>A1</td>
<td>B6</td>
<td>B7</td>
<td>Operational energy</td>
</tr>
<tr>
<td>Transport</td>
<td>A1</td>
<td>B7</td>
<td>C1</td>
<td>Operational water</td>
</tr>
<tr>
<td>Transport</td>
<td>A1</td>
<td>C2</td>
<td>C2</td>
<td>De-construction</td>
</tr>
<tr>
<td>Waste</td>
<td>A1</td>
<td>C3</td>
<td>C3</td>
<td>Transport</td>
</tr>
<tr>
<td>Processing</td>
<td>A1</td>
<td>C4</td>
<td>C4</td>
<td>Waste processing</td>
</tr>
<tr>
<td>Disposal</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>MND</td>
<td>X</td>
<td>X</td>
<td>MND</td>
<td></td>
</tr>
<tr>
<td>MND</td>
<td>X</td>
<td>MND</td>
<td>X</td>
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</tr>
<tr>
<td>MND</td>
<td>X</td>
<td>MND</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**RESULTS OF THE LCA - ENVIRONMENTAL IMPACT:** declared unit and product

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1 - A3</th>
<th>A5</th>
<th>B2</th>
<th>C2</th>
<th>C4</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global warming potential</td>
<td>[kg CO₂-eq]</td>
<td>1.31E+2</td>
<td>1.6E+0</td>
<td>3.12E+0</td>
<td>1.27E+0</td>
<td>1.83E-1</td>
<td>-8.62E+1</td>
</tr>
<tr>
<td>Depletion potential of the stratospheric ozone layer</td>
<td>[kg CFC11-eq]</td>
<td>6.3E+6</td>
<td>4.3E-11</td>
<td>4.5E-10</td>
<td>2.22E-11</td>
<td>3.42E-11</td>
<td>6.38E-9</td>
</tr>
<tr>
<td>Acidification potential of land and water</td>
<td>[kg SO₂-eq]</td>
<td>4.9E-1</td>
<td>4.11E-4</td>
<td>3.67E-1</td>
<td>5.27E-3</td>
<td>2.27E-4</td>
<td>-3.39E-1</td>
</tr>
<tr>
<td>Eutrophication potential</td>
<td>[kg (PO₄)₃ - eq]</td>
<td>4.85E-2</td>
<td>6.68E-5</td>
<td>7.51E-4</td>
<td>1.33E-5</td>
<td>4.15E-5</td>
<td>-2.8E-2</td>
</tr>
<tr>
<td>Formation potential of tropospheric ozone photochemical oxidants</td>
<td>[kg ETH11 eq]</td>
<td>1.86E-1</td>
<td>4.09E-5</td>
<td>3.45E-3</td>
<td>-1.8E-3</td>
<td>7.06E-5</td>
<td>-5.01E-2</td>
</tr>
<tr>
<td>Abiotic depletion potential for non renewable resources</td>
<td>[kg Sb eq]</td>
<td>4.22E-4</td>
<td>3.76E-8</td>
<td>2.57E-6</td>
<td>4.73E-8</td>
<td>1.6E-8</td>
<td>-2.55E-6</td>
</tr>
<tr>
<td>Abiotic depletion potential for fossil resources</td>
<td>[MJ]</td>
<td>1.53E+3</td>
<td>1.03E+0</td>
<td>7.48E+1</td>
<td>1.75E+1</td>
<td>5.95E-1</td>
<td>-2.72E+2</td>
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**RESULTS OF THE LCA - RESOURCE USE:** declared unit and product

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1 - A3</th>
<th>A5</th>
<th>B2</th>
<th>C2</th>
<th>C4</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable primary energy as carrier</td>
<td>[MJ]</td>
<td>8.6E+1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Renewable primary energy resources as material utilization</td>
<td>[MJ]</td>
<td>0.0E+0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total use of renewable primary energy resources</td>
<td>[MJ]</td>
<td>8.6E+1</td>
<td>6.41E-2</td>
<td>1.8E+0</td>
<td>6.9E-1</td>
<td>4.62E-2</td>
<td>1.3E+1</td>
</tr>
<tr>
<td>Non renewable primary energy as carrier</td>
<td>[MJ]</td>
<td>1.57E+3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Non renewable primary energy as material utilization</td>
<td>[MJ]</td>
<td>0.0E+0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total use of non renewable primary energy resources</td>
<td>[MJ]</td>
<td>1.57E+3</td>
<td>1.15E+0</td>
<td>7.78E+1</td>
<td>1.76E+1</td>
<td>6.23E-1</td>
<td>-7.8E+2</td>
</tr>
<tr>
<td>Use of secondary material</td>
<td>[kg]</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
</tr>
<tr>
<td>Use of renewable secondary fuels</td>
<td>[MJ]</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
</tr>
<tr>
<td>Use of non renewable secondary fuels</td>
<td>[MJ]</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
</tr>
<tr>
<td>Use of net fresh water</td>
<td>[m³]</td>
<td>5.71E+2</td>
<td>4.66E+0</td>
<td>1.43E+1</td>
<td>7.65E-1</td>
<td>-1.17E+0</td>
<td>-3.95E+1</td>
</tr>
</tbody>
</table>

**RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:** declared unit and product

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1 - A3</th>
<th>A5</th>
<th>B2</th>
<th>C2</th>
<th>C4</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous waste disposed</td>
<td>[kg]</td>
<td>7.99E-2</td>
<td>2.46E-2</td>
<td>1.44E-2</td>
<td>0.0E+0</td>
<td>4.45E-4</td>
<td>-4.8E-2</td>
</tr>
<tr>
<td>Non hazardous waste disposed</td>
<td>[kg]</td>
<td>2.41E+0</td>
<td>1.58E-2</td>
<td>1.8E-2</td>
<td>2.28E-3</td>
<td>3.15E+0</td>
<td>-1.14E-0</td>
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<tr>
<td>Radioactive waste disposed</td>
<td>[kg]</td>
<td>1.44E+2</td>
<td>4.7E-5</td>
<td>1.22E-3</td>
<td>2.45E-5</td>
<td>1.1E-5</td>
<td>2.02E-2</td>
</tr>
<tr>
<td>Components for re-use</td>
<td>[kg]</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
</tr>
<tr>
<td>Materials for recycling</td>
<td>[kg]</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
</tr>
<tr>
<td>Materials for energy recovery</td>
<td>[kg]</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
</tr>
<tr>
<td>Exported electrical energy</td>
<td>[MJ]</td>
<td>0.0E+0</td>
<td>2.02E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>-</td>
</tr>
<tr>
<td>Exported thermal energy</td>
<td>[MJ]</td>
<td>0.0E+0</td>
<td>5.66E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>0.0E+0</td>
<td>-</td>
</tr>
</tbody>
</table>

6. LCA: Interpretation

This chapter contains an interpretation of the Life Cycle Impact Assessment categories. When expressed as a percentage, the impact refers to its magnitude as a percentage of total product impact across all modules, with the exception of module D.

Production phase (module A1-A3) contributes between 96 and 100% to total impact assessment. This stage is dominated by upstream emissions associated with steel making 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

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EN 15804:2012-04: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

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Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus

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Physical Endurance for Steel Doors, Frames & Frame Anchors Physical endurance testing

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

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 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

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

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

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

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

UF C 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


GaBi 6 Documentation

GaBi 6 Software

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

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2006 Environmental management - Life cycle assessment - Requirements and guidelines

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

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

EWC 15 01 01:
EWC 15 01 03:

EWC 17 02 02:

EWC 15 04 05:
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<td>Mail</td>
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<td>Web</td>
<td><a href="http://www.pe-international.com">www.pe-international.com</a></td>
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