

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2





Owner of the Declaration	ASSA ABLOY Entrance Systems AB
Program holder	Institut Bauen und Umwelt e.V. (IBU)
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ASSA ABLOY RD700, Revolving Door ASSA ABLOY Entrance Systems

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1. General Information

ASSA ABLOY Entrance Systems	ASSA ABLOY RD700, Revolving Door
<p>Program holder IBU - Institut Bauen und Umwelt e.V. Hegelplatz 1 10117 Berlin Germany</p>	<p>Owner of the Declaration ASSA ABLOY Entrance Systems AB Lodjursgatan 10 SE-261 44 Landskrona Sweden</p>
<p>Declaration number EPD-ASA-20220074-IBC1-EN</p>	<p>Declared product / Declared unit This declaration represents 1 revolving door consisting of 3 door leaves and a surrounding frame with an internal diameter of 6.2 m and an internal height of 2.2 m</p>
<p>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)</p>	<p>Scope: This declaration and its LCA study are relevant to the revolving door ASSA ABLOY RD700. The final assembly and production stage occurs in Ostrov u Stribra, Czech Republic at ASSA ABLOY ES Production s.r.o at: D5 Logistic Park 34901 Ostrov u Stribra, Czech Republic. Components are sourced from international tier one suppliers. ASSA ABLOY RD700 door sizes vary according to project requirements; a door with an internal diameter of 6.2 m and 3 leaves 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. The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as EN 15804.</p>
<p>Issue date 18.08.2022</p>	<p>Verification The CEN Standard EN 15804 serves as the core PCR Independent verification of the declaration and data according to ISO 14025 <input type="checkbox"/> internally <input checked="" type="checkbox"/> externally</p>
<p>Valid to 17.08.2027</p>	<p></p>
<p> Dipl.-Ing. Hans Peters (President of IBU e.V.)</p>	<p> Dr. Wolfram Trinius (Independent tester appointed by SVA)</p>
<p> Dr. Alexander Röder (Managing Director of IBU e.V.)</p>	

2. Product

2.1 Product description

Product name: ASSA ABLOY RD700

Product characteristic:

Three-wing high-capacity revolving door.

Pedestrian automatic revolving doors are installations that serve to automatically regulate the flow of people in residential and non-residential buildings while providing high thermal performance.

- Automatic revolving doors are made up of various assemblies mainly consisting of a support structure, glazing, drive unit, controller and safety equipment.
- Revolving doors also feature elements that are designed to simplify their installation, operation, and maintenance.
- Revolving doors are typically made of aluminium and glass and are available in several designs for a range of requirements in diverse building types.

The ASSA ABLOY RD700 range of large three wing automatic revolving doors has been designed to achieve high pedestrian traffic flow whilst maintaining high standard of safety for the user. The door is designed so that in emergency situations, the door wings are released immediately to facilitate escape. The large-sized compartments, which are always accessible due to the three-wing configuration, make the ASSA ABLOY RD700 an ideal solution for continuous high-volume pedestrian traffic, while comfortably accommodating wheeled traffic such as shopping carts, luggage trolleys and wheelchairs.

The door has 4 primary parts:

- 1) Door leaves
- 2) Outer walls
- 3) Canopy
- 4) Operating system

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The ASSA ABLOY RD700 has been designed to meet operational and safety requirements and is certified by third party to fulfill the European Directives and the standards issued by the European Standardization Committee (CEN).

For the placing on the market in the European Union/European Free Trade Association (EU/EFTA) (excl. Switzerland), Switzerland and Turkey the the following European directives apply to the ASSA ABLOY RD700:

- 2014/30/EU Electromagnetic Compatibility Directive (EMCD)
- 2006/42/EC Machinery Directive (MD)
- 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment with the applicable amendments (RoHS).

These directives provide for CE marking of the product and issuing a Declaration of Conformity.

Harmonized European standards, which have been applied:

- EN 60335-1 Household and similar electrical appliances -Safety -Part 1: General requirements
- EN 60335-2-103 Household and similar electrical appliances -Safety -Part 2: Particular requirements for drives for gates, doors and windows
- EN 61000-6-2 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
- EN 61000-6-3 Electromagnetic compatibility (EMC) — Part 6-3: Generic standards — Emission standard for residential, commercial and light-industrial environments
- EN ISO 13849-1 Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design
- EN 16005 Power operated pedestrian door sets - Safety in use -Requirements and test methods.

Other standards or technical specifications, which have been applied:

- IEC 60335-1 Household and similar electrical appliances -Safety -Part 1: General requirements
- IEC 60335-2-103 Household and similar electrical appliances Safety Part 2-103: Particular requirements for drives for gates, doors and windows.

Disposal of the product is subject to the Waste from Electrical and Electronic Equipment (WEEE) Directive within Europe, Directive 2012/19/EU together with the RoHS Directive 2011/65/EU and its amending Directive 2015/863.

For the application and use the respective national provisions apply.

2.2 Application

The ASSA ABLOY RD700 is an automatic revolving door developed to provide draught free access to buildings. The door is designed to offer continuous

use, a high degree of safety and a maximum lifetime. The system is self-adjusting to the effects caused by normal variations in the weather conditions and to minor friction changes caused by e.g., dust and dirt. The door can be used indoors or outdoors.

Automatic revolving doors are utilized to provide entrance and exit capabilities for many building types. Typical revolving door applications are in:

- Private buildings
- Public buildings
- Healthcare facilities
- Hospitality facilities
- Transportation
- Sporting Venues

2.3 Technical Data

The table presents the technical properties of the ASSA ABLOY RD700:

Technical data

Name	Value	Unit
*U-value		
- closed position**	4.1	W/(m ² K)
- open position	5.3	
***Burglar protection class acc. to EN1627**	yes	-
Power input "Standby"	50	W
Power input "Operation"	113	W

* Heat transfer Coefficient of the entire door (U-value), in accordance with EN-ISO 10077-1 :2017 and EN-ISO 10077-2 :2017 Thermal performance of windows, doors and shutters - Calculation of thermal transmittance

**Closed position includes night closing doors

**To meet the standards of burglar protection, additional equipments has to be added.

Features:

The declared door has a size (W x H) 6200 x 2600 mm (Internal height)

Outer wall and night closing doors (optional): clear laminated safety glass 4+0.76+4mm (EN 12600/1B1) (standard)

Door leaves: standard -clear laminated safety glass 3+0.38+3mm (EN 12600/2B2)

Door sections: aluminium profiles, Optional: Powder-coated finish (RAL colours), Stainless steel cladding
Ceiling: white laminated panels.

Dust protection roof: white laminated panels.

2.4 Delivery status

Revolving door unit with an internal diameter of 6.2 m, an internal height of 2.2 m and an external height 2.54 m, is delivered ready for installation.

2.5 Base materials / Ancillary materials

The average composition for ASSA ABLOY RD700 is as follows:

Component	Percentage in mass (%)
Aluminium	23.885
Brass	0.039
Copper	0.471
Plastics	3.949
Stainless steel	2.486
Steel	23.327
Zinc	0.001
Glass	32.444
Electronic	1.175
Electro_mechanics	2.197
Paper	0.002

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Wood	9.423
Others	0.601
Total	100

This product/article/at least one partial article contains substances listed in the candidate list (date: 05.08.2022) exceeding 0.1 percentage by mass: no.

This product/article/at least one partial article contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: no.

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012): no.

2.6 Manufacture

The revolving door is manufactured in two locations, Ostrov, Czech Republic and Suzhou, China respectively. The Ostrov location is represented in this declaration. Profiles are provided by tier one supplier and are delivered to the factory. The profiles are bent and machined. The products are surface treated; either anodized (externally) or powder-coated (internally). Other parts as electronics, glass, etc. arrives from tier one suppliers. The parts are encased in pine crates and forwarded on a standard wooden pallet to on-site installation. The certified Quality Management system, *EN ISO 9001*, ensures high standards.

Offcuts and scraps during the manufacturing process are directed to a recycling unit. Waste is sent for disposal.

Waste codes according to *European Waste Catalogue and Hazardous Waste List (EWC)* - 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 01 copper, bronze, brass
 EWC 17 04 02 aluminum
 EWC 17 04 05 iron and steel
 EWC 17 04 11 Cables with the exception of those outlined in 17 04 10

2.7 Environment and health during manufacturing

ASSA ABLOY Entrance Systems AB 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, Greenhouse gases, energy, water, waste, volatile organic compound (VOC), surface treatment and Health & Safety 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. ASSA ABLOY Entrance Systems AB's management is aware of their environmental roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance.

- Preparation conditions (including the process of power coating) in the factory do not require special health and safety measures. Standard health and safety measures (work gloves, hearing protection, safety shoes, dust mask when sanding and milling, dust extraction, etc.) are observed where appropriate.
- Water and soil contamination does not occur and all production-related waste is processed internally in the appropriate manner.

2.8 Product processing/Installation

The revolving door components are supplied and ready for installation. The frame as well as the door leaves and central column are assembled and installed on-site. The components are assembled using simple tools including drills and hand tools. The installation is performed by trained and qualified installation technicians.

2.9 Packaging

Packaging exists for the purpose of protection during transportation. ASSA ABLOY RD700 revolving door components are initially packaged in plastic tarpaulin, polystyrene and corrugated cardboard. Finally, a revolving door is placed on a standard wooden pallet and encased in a pine crate. All of the packaging components are standard industry types and while the cardboard is recyclable. The pallets are available for immediate reuse upon delivery. The wood material is FSC certified.

Material	Value (%)
Cardboard/ Paper	1.04
Plastics	0.34
Wood	98.62
Total	100.0

All materials incurred during installation are directed to a recycling unit.

Waste codes according to *European Waste Catalogue and Hazardous Waste List (EWC)* - 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.

2.10 Condition of use

The best way to remove dust and dirt from the ASSA ABLOY RD700 and to maintain the quality of the enamel layer is to clean the surfaces three times/year (once/four months period) with gentle (pH 5-9), non-polishing detergent and water. Use a soft non-abrasive sponge.

To avoid damage to the profiles the brushes must be vacuum-cleaned weekly. Regular inspections performed by a trained and qualified person for a minimum of one visit per year, two are recommended. According to the *EN16005*

- Do not expose doors or profiles to alkalis. Both aluminum and glass are sensitive to alkalis.
- Do not clean with high-pressure water. Operator, programme selector and sensor may be damaged and water may enter the profiles.
- Do not use detergents or abrasive additives.
- Do not scrub with materials that will cause mechanical damage.

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2.11 Environment and health during use

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

2.12 Reference service life

The product has reference service life of approximately 10.000.000 cycles or 15 years of average daily use with the recommended maintenance and service program. For this EPD the lifetime of 15 years was considered.

2.13 Extraordinary effects

Fire

Not applicable

Water

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

Mechanical destruction

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

2.14 Re-use phase

The product is possible to re-use during the reference service life and be moved from location to another. All materials are directed to a recycling unit. The components made of aluminium alloy and steel can be recycled. The plastic components can be used for energy recovery within a waste incineration process.

Waste codes according to *European Waste Catalogue* and *Hazardous Waste List* -Valid from 1 January 2002.

EWC 16 02 14 Used devices with the exception of those outlined in 16 02 09 to 16 02 13

EWC 17 02 01 wood

EWC 17 02 03 plastic

EWC 17 04 01 copper, bronze, brass

EWC 17 04 02 aluminium

EWC 17 04 05 iron and steel

EWC 17 04 11 Cables with the exception of those outlined in 17 04 10

2.15 Disposal

The requirements on waste disposal and recycling listed in the *European Waste Catalogue* and *Hazardous Waste List (EWC)* should be followed. The product can be mechanically disassembled to separate the different materials. The majority of components are steel, glass and aluminium which will be recycled in case of steel and aluminium and landfill in case of glass. The plastic components are used for energy recovery in an incineration plant.

The disposal of the product is subject to the Waste Electrical and Electronic Equipment (WEEE) Directive within Europe, *Directive 2012/19/EU*

2.16 Further information

For further information and additional contact:

ASSA ABLOY Entrance Systems AB

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Sweden

www.assaabloyentrance.com

3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of revolving door ASSA ABLOY RD700 as specified in Part B requirements on the *IBU PCR Part B*.

Declared unit

Name	Value	Unit
Mass (without packaging)	2582.78	kg
Mass packaging (paper wood and plastics)	563.77	kg
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 phases were considered:

Production stage:

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

Construction stage:

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

Use stage related to the operation of the building includes:

- B6 – Operational energy use

End-of-life stage:

- C1 – De-construction/demolition
- 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.

- Benefits and loads beyond the system boundaries: D – Declaration of all benefits and loads

3.3 Estimates and assumptions

Transportation:

Real-world data for modes of transport and distances have been considered for those materials that contribute more than 2 % of total product mass. For materials contributing less than 2 % of total product mass, transport by road over an average distance of 500 km has been considered.

Use phase:

For the use phase, it is assumed that the door is used in the European Union, thus a European electricity grid mix is considered within this phase. According to the most representative scenario, the operating hours of the product are accounted for 2970 hours in on mode, 1650 hours in standby mode and finally 3300 hours in

idle mode per year (330 days per year in use); the power consumption throughout the whole life cycle is 8746.65 kWh.

EoL:

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

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

3.4 Cut-off criteria

In the assessment, all available data from the production process are considered, i.e. all raw materials used, auxiliary materials (e.g. lubricants), 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 10 Software System for Life Cycle Engineering*, developed by Sphera, is used *GaBi 10 2021a*. The *GaBi*-database contains consistent and documented datasets which are documented in the online *GaBi*-documentation *GaBi 10 2021b*. 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*.

Sphera 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 10* software database.

3.7 Period under review

The period under review is 2019 (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

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combusted material. In this EPD, the following specific life cycle inventories for the WIP are considered for:

- Waste incineration of paper
- Waste incineration of Plastic
- Waste incineration of Wood

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

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. *GaBi 10 2021b* serves as background database for the calculation.

4. LCA: Scenarios and additional technical information

The following technical information is a basis for the declared modules or can be used for developing specific scenarios in the context of a building assessment if modules are not declared (MND).

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic Carbon Content in product	121.71	kg C
Biogenic Carbon Content in accompanying packaging	280.52	kg C

Transport to the building site (A4)

Name	Value	Unit
Truck transport		
Litres of fuel diesel with maximum load (27t payload)	27.505	kg/100km
Transport distance truck (primary target market is EU 28)	835	km
Capacity utilization (incl. empty runs) of truck	61	%
Transport by ship	0	km

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site (paper/cardboard packaging)	5.85	kg
Output substances following waste treatment on site (wood packaging)	556	kg
Output substances following waste treatment on site (plastic packaging)	1.92	kg

Reference service life

Name	Value	Unit
Reference service life	15	a

Operational energy use (B6)

Name	Value	Unit
Electricity consumption per RSL (15 years, 250 days per year)	8746.65	kWh
Hours per day in on mode	9	h
Hours per day in stand-by mode	5	h
Hours per day in idle mode	10	h
Power consumption – on mode	113	W
Power consumption – stand-by mode	50	W
Power consumption – idle mode	50	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
- $days_year$ - Operation days per year
- 0.001 - Conversion factor from Wh to kWh.

End of life (C1-C4)

Name	Value	Unit
Collected separately	2582.783	kg
Incineration of plastic parts	101.989	kg
Incineration of paper	0.050	kg
Incineration of wood	243.377	
Recycling aluminium, steel, electronic, electro-mechanics, stainless steel, copper, brass	1383.899	kg
Landfill	853.468	kg

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

Name	Value	Unit
Collected separately waste type (including packaging)	2293.085	kg
Recycling aluminium	26.904	%
Recycling brass	0.044	%
Recycling copper	0.530	%
Recycling stainless steel	2.800	%
Recycling steel	26.274	%
Recycling zinc	0.001	%
Recycling electronic	1.324	%
Recycling electro mechanics	2.475	%
Incineration of plastic parts	4.448	%
Incineration of wood	10.614	%
Incineration of packaging (paper, wood and plastic) (from A5)	24.586	%

5. LCA: Results

Results shown are calculated according to EN 15804+A2.

Note:

EP-freshwater: This indicator has been calculated as “kg P eq” as required in the characterization model (EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe; <http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml>).

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 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	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece of RD700

Core Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ -Eq.]	1.06E+04	1.05E+01	1.05E+03	3.54E+03	0.00E+00	1.22E+00	7.24E+02	1.28E+02	-6.61E+03
GWP-fossil	[kg CO ₂ -Eq.]	1.20E+04	1.05E+01	1.11E+01	3.52E+03	0.00E+00	1.21E+00	2.74E+02	1.29E+02	-6.59E+03
GWP-biogenic	[kg CO ₂ -Eq.]	-1.36E+03	-1.79E-02	1.03E+03	1.17E+01	0.00E+00	-2.08E-03	4.49E+02	-7.72E-01	-1.18E+01
GWP-luluc	[kg CO ₂ -Eq.]	7.70E+00	8.49E-02	2.03E-03	5.10E+00	0.00E+00	9.84E-03	1.16E-02	3.50E-02	-2.51E+00
ODP	[kg CFC11-Eq.]	5.47E-08	1.26E-15	1.66E-14	7.75E-11	0.00E+00	1.46E-16	1.06E-13	9.90E-14	1.08E-09
AP	[mol H ⁺ -Eq.]	5.20E+01	1.08E-02	1.21E+00	7.77E+00	0.00E+00	1.25E-03	5.68E-01	9.37E-02	-3.17E+01
EP-freshwater	[kg PO ₄ -Eq.]	1.48E-02	3.19E-05	3.36E-06	9.40E-03	0.00E+00	3.69E-06	1.71E-05	2.71E-05	-3.34E-03
EP-marine	[kg PO ₄ -Eq.]	9.11E+00	3.13E-03	2.99E-01	1.73E+00	0.00E+00	3.63E-04	1.41E-01	2.42E-02	-3.99E+00
EP-terrestrial	[mol N-Eq.]	1.00E+02	3.77E-02	3.31E+00	1.81E+01	0.00E+00	4.37E-03	1.61E+00	3.09E-01	-4.34E+01
POCP	[kg NMVOC-Eq.]	2.67E+01	8.70E-03	9.72E-01	4.73E+00	0.00E+00	1.01E-03	4.54E-01	7.13E-02	-1.26E+01
ADPE	[kg Sb-Eq.]	1.57E+05	1.40E+02	2.45E+01	6.19E+04	0.00E+00	1.62E+01	1.31E+02	1.86E+02	-8.34E+04
ADPF	[MJ]	4.89E-01	7.52E-07	2.75E-07	1.02E-03	0.00E+00	8.72E-08	1.54E-06	1.72E-06	-2.88E-01
WDP	[m ³ world-Eq deprived]	9.49E+02	9.37E-02	3.62E+01	7.67E+02	0.00E+00	1.09E-02	4.36E+01	1.37E+01	-8.97E+02

Caption: GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

RESULTS OF THE LCA - RESOURCE USE: One piece of RD700

Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PERE	[MJ]	3.48E+04	0.00E+00	1.07E+04	0.00E+00	0.00E+00	0.00E+00	4.66E+03	0.00E+00	0.00E+00
PERM	[MJ]	1.53E+04	0.00E+00	-1.07E+04	0.00E+00	0.00E+00	0.00E+00	-4.63E+03	0.00E+00	0.00E+00
PERT	[MJ]	5.04E+04	7.84E+00	4.15E+00	2.74E+04	0.00E+00	9.10E-01	3.03E+01	3.18E+01	-3.19E+04
PENRE	[MJ]	1.47E+05	0.00E+00	1.01E+02	0.00E+00	0.00E+00	0.00E+00	5.75E+03	0.00E+00	0.00E+00
PENRM	[MJ]	5.70E+03	0.00E+00	-7.68E+01	0.00E+00	0.00E+00	0.00E+00	-5.62E+03	0.00E+00	0.00E+00
PENRT	[MJ]	1.57E+05	1.40E+02	2.45E+01	6.19E+04	0.00E+00	1.62E+01	1.31E+02	1.86E+02	-8.35E+04
SM	[kg]	5.93E+02	0.00E+00	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	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	0.00E+00
FW	[m ³]	7.45E+01	9.08E-03	8.36E-01	3.17E+01	0.00E+00	1.05E-03	1.03E+00	3.36E-01	-7.89E+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 RD700

Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
HWD	[kg]	5.59E-04	6.50E-06	6.57E-08	2.56E-05	0.00E+00	7.54E-07	3.88E-07	2.18E-06	-6.12E-05
NHWD	[kg]	1.52E+03	2.14E-02	6.01E+00	4.39E+01	0.00E+00	2.48E-03	2.85E+01	6.58E+02	-1.42E+03
RWD	[kg]	8.71E+00	1.73E-04	7.07E-04	9.39E+00	0.00E+00	2.01E-05	7.08E-03	3.60E-03	-4.99E+00
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	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	5.62E+02	0.00E+00	0.00E+00	0.00E+00	2.38E+03	0.00E+00	0.00E+00
MER	[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	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	2.78E+03	0.00E+00	0.00E+00	0.00E+00	1.81E+03	2.65E-01	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	3.93E+03	0.00E+00	0.00E+00	0.00E+00	2.78E+03	4.98E-01	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; EEE = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: One piece of RD700

Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PM	[Disease Incidence]	5.09E-04	6.40E-08	5.21E-06	6.52E-05	0.00E+00	7.42E-09	2.79E-06	1.16E-06	-3.23E-04
IR	[kBq U235-Eq.]	1.48E+03	2.50E-02	8.23E-02	1.54E+03	0.00E+00	2.90E-03	9.96E-01	3.43E-01	-9.89E+02
ETP-fw	[CTUe]	8.10E+04	9.86E+01	2.78E+01	2.65E+04	0.00E+00	1.14E+01	9.42E+01	9.51E+01	-2.79E+04
HTP-c	[CTUh]	1.17E-04	2.07E-09	7.24E-08	7.31E-07	0.00E+00	2.40E-10	3.59E-08	1.29E-08	2.38E-05
HTP-nc	[CTUh]	1.61E-04	1.07E-07	6.25E-06	2.69E-05	0.00E+00	1.24E-08	3.18E-06	1.39E-06	-7.44E-05
SQP	[-]	1.59E+05	4.90E+01	4.55E+00	1.97E+04	0.00E+00	5.68E+00	3.30E+01	4.41E+01	-5.56E+03
Caption	PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index									

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

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 60.95 % and 84.34 % to the overall results for all the environmental impact assessment categories hereby considered, except for the abiotic depletion potential (ADPE), for which the contribution from the production stage accounts for 100 % - this impact category describes the reduction of the global amount of non-renewable raw materials, therefore, as expected, it is mainly related with the extraction of raw materials (A1). Also, ODP shows a higher contribution of 99.85 %

Within the production stage, the main contribution for all the impact categories is the production of steel and aluminum mainly due to the energy consumption in these processes. These two materials account for

approx. 49.7 % to the overall mass of the product, therefore, the impacts are in line with the mass composition of the product. The environmental impacts for the transport (A2) have a negligible impact within this stage.

To reflect the use stage (module B6), the energy consumption was included, and it has a major contribution to all the impact assessment categories considered - between 9 % and 40 %, with the exception of ODP (0.15° %). This is a result of 9 hours of operation in on mode, 5 hours in stand-by mode and 10 hours in idle mode per day and per 330 days in a year.

In the end-of-life stage, there are loads and benefits (module D, negative values) considered. The benefits are considered beyond the system boundaries and are declared for the recycling potential of the metals and for the credits from the incineration process (energy substitution).

7. Requisite evidence

Not applicable in this EPD.

8. References

Standards, norms, directives:

CPR

Regulation (EU) No. 305/2011, Construction Product Regulation (CPR)- laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

DIN EN 1627

DIN EN 1627:2021-11, Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Requirements and classification

DIN EN ISO 10140-2

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

DIN EN ISO 13849-1

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

DIN 4102

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

DIN EN 12424

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

DIN EN 12426

DIN EN 12424:2000, Industrial, commercial and garage doors and gates. Air permeability. Classification; German version EN 12424:2000

DIN EN 12428

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

DIN EN 12600

DIN EN 12600:2003-04, Glass in building - Pendulum tests - Impact test method and classification for flat glass;

DIN EN ISO 14025

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

DIN EN 16005

DIN EN 16005:2013-01, Power operated pedestrian doorsets - Safety in use - Requirements and test method

DIN EN 60335-1

DIN EN 60335-1:2020, Household and similar electrical appliances - Safety - Part 1: General requirements

DIN EN 60335-2

DIN EN 60335-2:2016, Household and similar electrical appliances - Safety - Part 2-103: Particular requirements for drives for gates, doors and windows

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EN 12425

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

EN 12453

EN 12453:2017, Industrial, commercial and garage doors and gates – Safety in use of power operated doors – Requirements and test methods

EN 13241-1

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

EN 15804+A2

EN 15804:2014+A2:2019, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

EN 61000-6-2

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

EN 61000-6-3

EN 61000-6-3:2007, Electromagnetic compatibility (EMC) - Part 6-3: Generic Standards - Emission standard for residential, commercial and light-industrial environments

EWC

European Waste Catalogue established by Commission Decision 2000/532/EC

ISO 9001

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

ISO 14001

ISO 14001:2015, Environmental management systems — Requirements with guidance for use

2006/42/EC

European directive on machinery, and amending Directive 95/16/EC (recast)

2011/65/EC

European directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment, and its amendment directives including 2015/863/EC (RoHS directive)

2012/19/EU

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European directive on waste electrical and electronic equipment (WEEE)

2014/30/EU

European directive on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast)

2015/863/EU

European directive amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances

Other sources:

GaBi 10 2021a

GaBi 10 2021: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, Sphera, Echterdingen, 1992-2018.

GaBi 10 2021b

GaBi 10 2021b: Documentation of *GaBi 8*: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, Sphera, Echterdingen, 1992-2021.
<https://GaBi.sphera.com/internationalsupportGaBi>

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 Project Report according to EN 15804+A2:2019, Version 1.1.1, 2021
www.ibu-epd.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 Automatic doors, automatic gates and revolving door systems Version 1.6 (11. 2017) www.ibu-epd.com

IBU 2021

General Instructions for the EPD programme of Institut Bauen und Umwelt e.V. Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021.
www.ibu-epd.com

TRACI Methodology

Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI), EPA/600/R-12/554 2012
asdas

9. Annexe

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 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	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece of RD200-3

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C1	C2	C3	C4	D
GWP	Global warming potential, excl. biogenic	[kg CO2-eq.]	1.18E+04	1.03E+01	6.81E+00	3.47E+03	0.00E+00	1.20E+00	2.72E+02	1.28E+02	-6.52E+03
GWP	Global warming potential, incl. biogenic	[kg CO2-eq.]	1.04E+04	1.03E+01	1.04E+03	3.45E+03	0.00E+00	1.19E+00	7.21E+02	1.27E+02	-6.52E+03
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-eq.]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
AP	Acidification potential of land and water	[kg SO2-eq.]	4.42E+01	1.00E-02	1.87E+00	7.57E+00	0.00E+00	0.00E+00	8.90E-01	1.00E-01	-2.65E+01
EP	Eutrophication potential	[kg N-eq.]	1.82E+00	0.00E+00	6.00E-02	7.10E-01	0.00E+00	0.00E+00	3.00E-02	0.00E+00	-7.20E-01
Smog	Ground-level smog formation potential	[kg O3-eq.]	5.27E+02	1.50E-01	1.96E+01	1.01E+02	0.00E+00	2.00E-02	9.16E+00	1.50E+00	-2.56E+02
Resources	Resources – resources fossil	[MJ surplus energy]	1.18E+04	2.00E+01	2.44E+00	2.62E+03	0.00E+00	2.32E+00	9.75E+00	1.99E+01	-6.93E+03

RESULTS OF THE LCA - RESOURCE USE: One piece of RD200-3

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C1	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	3.48E+04	0.00E+00	1.07E+04	0.00E+00	0.00E+00	0.00E+00	4.66E+03	0.00E+00	0.00E+00
PERM	Renewable primary energy resources as material utilization	[MJ]	1.53E+04	0.00E+00	-1.07E+04	0.00E+00	0.00E+00	0.00E+00	-4.63E+03	0.00E+00	0.00E+00
PERT	Total use of renewable primary energy resources	[MJ]	5.04E+04	7.84E+00	4.15E+00	2.74E+04	0.00E+00	9.10E-01	3.03E+01	3.18E+01	-3.19E+04
PENRE	Non-renewable primary energy as energy carrier	[MJ]	1.47E+05	0.00E+00	1.01E+02	0.00E+00	0.00E+00	0.00E+00	5.75E+03	0.00E+00	0.00E+00
PENRM	Non-renewable primary energy as material utilization	[MJ]	5.70E+03	0.00E+00	-7.68E+01	0.00E+00	0.00E+00	0.00E+00	-5.62E+03	0.00E+00	0.00E+00
PENRT	Total use of non-renewable primary energy resources	[MJ]	1.57E+05	1.40E+02	2.45E+01	6.19E+04	0.00E+00	1.62E+01	1.31E+02	1.86E+02	-8.35E+04
SM	Use of secondary material	[kg]	5.93E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	Use of renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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NRSF	Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	Use of net fresh water	[m³]	7.45E+01	9.08E-03	8.36E-01	3.17E+01	0.00E+00	1.05E-03	1.03E+00	3.36E-01	-7.89E+01

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of RD200-3

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C1	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	5.59E-04	6.50E-06	6.57E-08	2.56E-05	0.00E+00	7.54E-07	3.88E-07	2.18E-06	-6.12E-05
NHWD	Non-hazardous waste disposed	[kg]	1.52E+03	2.14E-02	6.01E+00	4.39E+01	0.00E+00	2.48E-03	2.85E+01	6.58E+02	-1.42E+03
RWD	Radioactive waste disposed	[kg]	8.71E+00	1.73E-04	7.07E-04	9.39E+00	0.00E+00	2.01E-05	7.08E-03	3.60E-03	-4.99E+00
CRU	Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	Materials for recycling	[kg]	0.00E+00	0.00E+00	5.62E+02	0.00E+00	0.00E+00	0.00E+00	2.38E+03	0.00E+00	0.00E+00
MER	Materials for energy recovery	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	Exported electrical energy	[MJ]	0.00E+00	0.00E+00	2.78E+03	0.00E+00	0.00E+00	0.00E+00	1.81E+03	2.65E-01	0.00E+00
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	3.93E+03	0.00E+00	0.00E+00	0.00E+00	2.78E+03	4.98E-01	0.00E+00

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