Environmental Product Declaration (EPD)

Declaration Code: EPD-STA-22.0

record
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agtatec ag

record system 20

Basis:

DIN EN ISO 14025
EN 15804

Company EPD
Environmental
Product **D**eclaration

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Programme operator	ift Rosenheim GmbH Theodor Gietl Straße 7-9 D-83026 Rosenheim
Practitioner of the LCA	ift Rosenheim GmbH Theodor Gietl Straße 7-9 D-83026 Rosenheim
Declaration holder	agtatec ag Allmendstrasse 24 CH 8320 Fehraltorf
Declaration code	EPD-STA-22.0
Designation of declared product	record system 20
Scope	Automatic sliding door systems of customisable design for the passage of persons for internal and external applications.
Basis	This EPD was prepared on the basis of EN ISO 14025:2011 and EN 15804:2012+A1:2013. In addition, the “Allgemeiner Leitfaden zur Erstellung von Typ III Umweltproduktdeklarationen” (Guidance on preparing Type III Environmental Product Declarations) applies. This Declaration is based on the PCR document “Doors” (PCR-TT-1.1:2011).
Validity	Publication date: 06 April 2016 / Last revision: 06 April 2016 / Next revision: 06 April 2021 This verified Company Environmental Product Declaration (company EPD) applies solely to the specified products and is valid for a period of 5 years from the date of publication in accordance with DIN EN 15804.
LCA basis	The LCA was prepared in accordance with DIN EN ISO 14040 and DIN EN ISO 14044. The base data include both the data collected at the agtatec ag production site and the generic data derived from the “GaBi ts” database. LCA calculations were based on the “cradle to gate” life cycle with options (cradle to gate with options) including all upstream processes (e.g. raw material extraction, etc.).
Notes	The “Conditions and Guidance on the Use of ift Test Documents” apply. The declaration holder assumes full liability for the underlying data, certificates and verifications.

Prof. Ulrich Sieberath Director of Institute	Florian Stich Verifier

1 General product information

Product definition

The EPD relates to the product group “doors” and applies to the product:

“record system 20” from the company **agtatec ag**
The LCA was prepared using the declared unit:

1 m² area

This functional unit is declared as follows:
1,500 mm x 2,200 mm

Directly used material flows are assigned to the functional unit.
All other inputs and outputs of “record system 20” were scaled to the declared unit since no typical functional unit was available due to the great diversity of variants. The reference period is the year 2014.

Product description

record system 20 is the latest generation of automatic sliding door systems.

record system 20 fulfills the requirements of the Machinery Directive 2006/42/EC; of DIN EN 18, EN 16 005 and EN 14351; and of all relevant national and international standards.

This environmental product declaration covers a double leaf design without side panels (2 sliding doors), including a sliding door drive comprised of control unit, motor, 2 combined release and safety sensors, battery pack and operating unit.

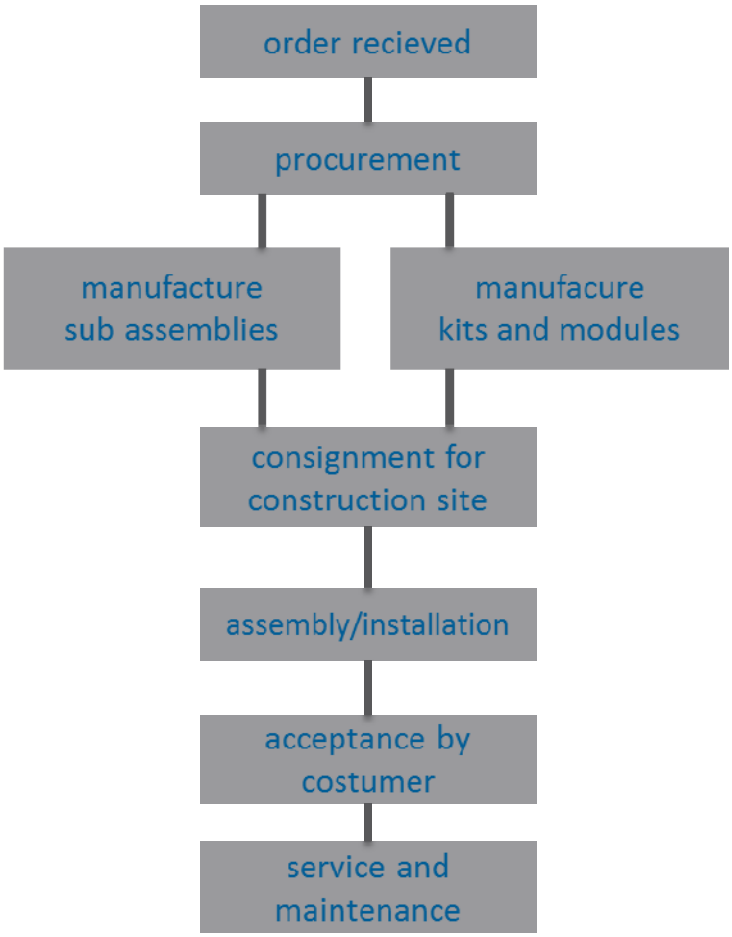
record sliding doors are available in a wide variety of functional specifications to meet the specialised application and operating requirements encountered in different types of building.

The slim profile system in combination with the matching glazing system ensures maximum transparency.

Furthermore, a great variety of finishes and colours are available, e.g. for door leaves, side panels and drive covers.

For a detailed product description refer to the manufacturer specifications at www.record.global or the product descriptions for the desired product.

Product manufacture



Application

Automatic sliding door systems of customisable design for the passage of persons for internal and external applications. The side panels are not considered part of the sliding doors.

Verification

record system 20 conforms to the essential safety and health protection requirements of the following Directives:
• Machinery Directive 2006/42/EC (Annex I)
• Low Voltage Directive 2006/95
• EMC Directive 2004/108/EC
The following harmonised standards are applied:
• DIN EN 16005:2013
• DIN 18650-1/-2:2010
• EN ISO 13849-1:2008
• DIN EN 60335-2-103:2010 in combination with DIN EN 16005:2013
• AutSchR:1997 (Directive for Automatic Sliding Doors) (sliding doors designed for emergency exit routes)

Management systems

The following management systems are in place:

- Quality management system as per DIN EN ISO 9001:2008
- Environmental management system as per DIN EN ISO 14001:2004

Additional information

record system 20 allows a great variety of door designs to be implemented, in some cases permitting combinations of characteristics

pertaining to the folllowing to be achieved, depending on the place of application and the specific requirements:

- Use on escape and emergency exit routes
- Thermal insulation
- Burglar resistance
- Fire safety
- Smoke leakage
- Watertightness
- Resistance to wind load
- Air permeability
- Sound insulation
- etc.

2 Materials used

Primary materials

The primary materials used are listed in the LCA (see Section 7).

Declarable substances

The product contains no substances from the REACH candidate list (declaration dated 22 March 2016).

All relevant safety data sheets are available from the company agtatec ag.

3 Construction process stage

Processing recommendations, installation

Observe the instructions for assembly/installation, operation, maintenance and disassembly. Refer to www.record.global

4 Use stage

Emissions to the environment

No emissions to indoor air, water or soil are known.

Reference service life (RSL)

The RSL information was provided by the manufacturer. The RSL shall refer to the declared technical and functional performance of the product within the building. It shall be established in accordance with specific rules set out in the European product standards and shall also take into account ISO 15686-1, -2, -7 and -8. Where European product standards provide guidance on determining RSL, such guidance shall have priority. If it is not possible to determine the service life as the RSL in accordance with ISO 15686, the table “Nutzungsdauern von Bauteilen zur Lebenszyklusanalyse nach BNB” (“Service life of building components for life cycle analysis in accordance with the Sustainable Construction evaluation system” of the German Federal Institute for Research on Building, Urban Affairs and Spatial Development) can be used. For further information and explanations refer to www.nachhaltigesbauen.de.

For this EPD the following applies:
The reference service life (RSL) can be determined for a “cradle to gate - with options” EPD only if all of the modules A1-A3 and B1-B5 are specified;

According to the manufacturer, the product “record system 20” manufactured by agtatec ag has an optional service life of 10 years. This corresponds to approximately 1,000,000 closing cycles (according to the manufacturer) at approx. 100,000 closing cycles per year.

RSL is dependent on the characteristics of the product and reference in-use conditions. The applicable characteristics are as follows:

- Declared product characteristics: see Section 1 (General product information - Product definition)
- Design application parameters: see Section 4 (Construction process stage - processing recommendations) and Section 1 (General product information - Additional information)
- Assumed quality of work: see Section 4 (Construction process stage - processing recommendations) and Section 1 (General product information - Application)
- Outdoor environment: the following influences may have an impact on the reference service life: heat, air, wind, water
- Indoor environment: no impacts known that have a negative effect on the reference service life
- In-use conditions: see Section 9 (Annex). The reference service life applies only to the referenced in-use conditions
- Maintenance: see Section 9 (Annex/B2 - Maintenance)

The service life applies solely to the characteristics specified in this EPD or the corresponding references.
RSL does not reflect the actual life span, which is usually determined by the service life and when the building is renovated. It does not provide any indication of durability, nor does it constitute a warranty with regard to the product’s performance characteristics, nor any kind of guarantee.

5 End-of-life stage

Possible end-of-life stages

The product record system 20 is shipped to central collecting points. There it is usually shredded and sorted into its original pure components. Aluminium, steel, glass, etc. are recycled. Residual fractions are thermally recycled.

Disposal routes

The LCA includes the average disposal routes.

All life cycle scenarios are detailed in the Annex.

6 Life Cycle Assessment (LCA)

Environmental product declarations are based on life cycle analyses (LCAs), which use material and energy flows for the calculation and subsequent representation of environmental impacts.

As the basis for this, a Life Cycle Analysis (LCA) was prepared for the product record system 20. The LCA is in conformity with EN 15804 and the requirements set out in the international standards DIN EN ISO 14040, DIN EN ISO 14044, ISO 21930 and EN ISO 14025.

The LCA is representative of the products presented in the Declaration and the specified reference period.

6.1 Definition of goal and scope

Goal

The goal of the LCA is to demonstrate the environmental impacts of the product “record system 20”. In accordance with EN 15804, the environmental impacts covered by this Environmental Product Declaration are presented in the form of basic information for the entire product life cycle. Apart from these, no other environmental impacts have been specified/presented.

Data quality, data availability, and geographical and time-related system boundaries

The specific data originate exclusively from the fiscal year 2015. They were collected on-site at the plant located in Fehraltorf and originate partly from company records and partly from values directly obtained by measurement. Validity of the data was checked by the ift.

The generic data originate from the GaBi ts professional and construction materials databases. The last update of both databases was in 2016. Data before this date originate also from these databases and are not more than 4 years old. No other generic data were used for the calculation.

Data gaps were either filled with comparable data or conservative assumptions, or the data were cut off in compliance with the 1% rule.

The life cycle was modelled using the sustainability software tool “GaBi t” for the development of Life Cycle Assessments.

Scope/system boundaries

The system boundaries refer to the supply of raw materials and purchased parts, manufacture/production, use and end-of-life stage of the product record system 20 (cradle to gate with options).
No additional data from pre-suppliers/subcontractors or other sites were taken into consideration.

Cut-off criteria

All company data collected, i.e. all commodities/input and raw materials used, the thermal energy and electricity consumption, were taken into consideration.

The boundaries cover only the production-relevant data. Building

sections/parts of facilities that are not relevant to the manufacture of the products were excluded.

The transport distances of the primary products/pre-products were taken into consideration as a function of at least 99% of the mass of the product record system 20.

The criteria for the exclusion of inputs and outputs as set out in EN 15804 are fulfilled. It can be assumed that the total of negligible processes per life cycle stage does not exceed 1 percent of the mass/primary energy. This way the total of negligible processes does not exceed 5 percent of the energy and mass input. The life cycle calculation also includes material and energy flows that account for less than 1 percent.

6.2 Inventory analysis

Goal

All material and energy flows are described below. The processes covered are presented as input and output parameters and refer to the declared/functional unit.

Life cycle stages

The Annex illustrates the entire life cycle of the product record system 20. The modules are shown as described in the Annex.

Benefits

The following benefits have been defined as per EN 15804:

- Benefits from recycling
- Benefits (thermal and electrical) from incineration

Allocation procedures Allocation of co-products

The manufacture of the product record system 20 does not produce any allocations.

Allocations for re-use, recovery and reycling

If the product record system 20 is reused/recycled during the product stage (rejects), the components are shredded and then sorted into their original pure components, as necessary. This is realised by various process plants, e.g. magnetic separators. The system boundaries of record system 20 were set following their disposal, with termination of their waste characteristics.

Allocations beyond life cycle boundaries

Use of recycled materials in the manufacturing process was based on the current market-specific situation. In parallel to this, a recycling potential was taken into consideration that reflects the economic value of the product after recycling (recyclate). The system boundary set for the recycled material refers to collection.

Secondary material

The use of secondary materials by the company agtatec ag in Module A3 was considered. Secondary material is not used.

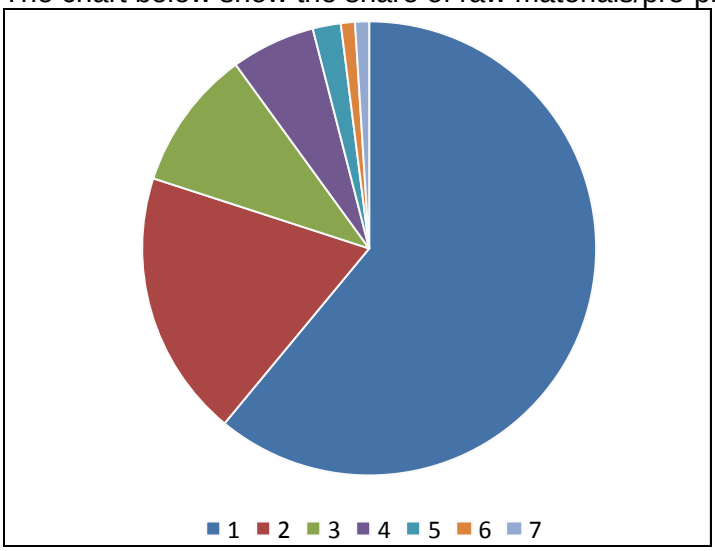
Inputs

The LCA includes the following production-relevant inputs:

Energy
The electricity mix is based on “Switzerland electricity mix”.

Water
The water consumed by the individual process steps for the manufacture of record system 20 amounts to a total of 0.5 l per m² unit. The consumption of fresh water specified in Section 6.3 originates from (among other sources) the upstream processes of the primary products/pre-products.

Raw material/primary products/pre-products
The chart below show the share of raw materials/pre-products in %.



No.	Material	Mass in %
1	Glass	61
2	Aluminium	19
3	Steel	10
4	Plastics	6
5	Motor	2,5
6	Battery	1,5
7	Other	1

Table 1: Share of individual materials in percent

Outputs

The LCA includes the following production-relevant outputs per m² of record system 20:

Waste
Secondary raw materials were included in the benefits.
See Section 6.3 (Impact assessment)

Waste water
The manufacture of the product record system 20 produces 0.5 l of

waste water per m².

6.3 Impact assessment

Goal

The impact assessment covers inputs and outputs. The impact categories applied are named below:

Impact categories

The models for impact assessment were applied as described in EN 15804-A1.
The impact categories presented in the EPD are as follows:

- Depletion of abiotic resources (fossil fuels);
- Depletion of abiotic resources (elements);
- Acidification of soil and water;
- Ozone depletion;
- Global warming;
- Eutrophication;
- Photochemical ozone creation.

Waste

The waste generated during the production of 1 m² of record system 20 is evaluated and shown separately for each of the three main fractions, namely trade wastes, special wastes and radioactive wastes. Since waste handling is modelled within the system boundaries, the amounts shown refer to the deposited wastes. A portion of the waste indicated is generated during the manufacture of the pre-products. The wastes presented are generated throughout the entire product life cycle.

Results per m^2 of record system 20 (Part 1)																
Environmental impacts	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D*)**
Global warming potential (GWP)	kg CO_2-equiv.	111	0.306	1.07	-	1.85	-	-	-	362	0	0	0.112	2.86	3.91	-83.2
Ozone depletion potential of stratospheric layer (ODP)	kg R11-equiv.	4.18E-06	1.41E-12	5.77E-11	-	6.15E-12	-	-	-	9.02E-07	0	0	5.14E-13	2.03E-09	1.21E-11	-2.10E-08
Acidification potential of soil and water (AP)	kg SO_2-equiv.	0.723	1.33E-03	2.62E-04	-	2.49E-03	-	-	-	0.658	0	0	6.81E-04	7.95E-03	2.91E-03	-0.375
Eutrophication potential (EP)	kg PO_4^3-equiv.	0.0571	3.27E-04	2.32E-04	-	1.81E-03	-	-	-	0.1	0	0	1.70E-04	7.11E-04	4.12E-04	-0.0236
Formation potential of tropospheric ozone photo-chemical oxidants (POCP)	kg C_2H_4-equiv.	5.02E-03	-4.56E-04	6.58E-05	-	1.47E-04	-	-	-	0.0506	0	0	-2.83E-04	5.48E-04	2.87E-04	-0.0276
Abiotic depletion potential - non-fossil resources (ADP - elements)	kg Sb-equiv.	7.88E-03	2.04E-08	5.41E-08	-	5.02E-07	-	-	-	3.87E-04	0	0	7.44E-09	9.33E-07	1.73E-07	-3.35E-05
Abiotic depletion potential - fossil fuels (ADP - fossil resources)	MJ	1300	4.22	0.615	-	2.88	-	-	-	3410	0	0	1.54	30.9	6.18	-925
Use of resources	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D*)**
Use of renewable primary energy - excluding re-newable primary energy resources used as raw materials	MJ	160	0.24	0.505	-	0.424	-	-	-	7120	0	0	0.0875	13.9	0.739	-370
Use of renewable primary energy resources used as raw materials (material use)	MJ	0	0	0	-	0	-	-	-	0	0	0	0	0	0	0
Total use of renewable primary energy resources (primary energy and renewable primary energy resources used as raw materials) (energy + material use)	MJ	160	0.24	0.505	-	0.424	-	-	-	7120	0	0	0.0875	13.9	0.739	-370
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	1560	0	0	-	0	-	-	-	0	0	0	0	0	0	0
Use of non-renewable primary energy resources used as raw materials (material use)	MJ	0	0	0	-	0	-	-	-	0	0	0	0	0	0	0
Total use of non-renewable primary energy re-sources (primary energy and non-renewable primary energy resources used as raw materials) (energy + material use)	MJ	1560	4.24	1.25	-	3.13	-	-	-	12900	0	0	1.55	49.8	6.46	-1080
Use of secondary materials	kg	0	0	0	-	0	-	-	-	0	0	0	0	0	0	0

Results per m^2 of record system 20 (Part 2)																
Use of resources	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D*)**
Use of renewable secondary fuels	MJ	-0.0596	1.38E-05	1.46E-04	-	6.90E-04	-	-	-	0.362	0	0	5.03E-06	5.81E-04	0.0112	0.0732
Use of non-renewable secondary fuels	MJ	-0.938	2.10E-04	6.36E-04	-	7.65E-03	-	-	-	5.48	0	0	7.65E-05	8.79E-03	0.0229	1.22
Use of net fresh water	m^3	0.853	6.01E-04	3.18E-03	-	0.0131	-	-	-	9.9	0	0	2.19E-04	0.0215	0.00872	-1
Waste categories	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D*)**
Hazardous waste disposed	kg	9.25E-06	3.20E-07	2.79E-09	-	1.93E-08	-	-	-	1.07E-05	0	0	1.17E-07	3.16E-08	1.38E-07	-1.03E-06
Non-hazardous waste disposed (municipal waste)	kg	4.15	3.56E-04	0.176	-	0.603	-	-	-	16.8	0	0	1.30E-04	0.03	28	-18.4
Radioactive waste	kg	0.0878	6.06E-06	2.45E-04	-	1.01E-04	-	-	-	3.68	0	0	2.21E-06	7.51E-03	1.12E-04	-0.0596
Output material flows	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D*)**
Components for re-use	kg	0	0	0	-	0	-	-	-	0	0	0	0	0	0	0
Materials for recycling	kg	0	0	0	-	0	-	-	-	0	0	0	0	17.7	0	0
Materials for energy recovery	kg	0	0	0	-	0	-	-	-	0	0	0	0	4.43	0	0
Exported energy (electricity)	MJ	1.69	0	1.17	-	0	-	-	-	0	0	0	0	0	0	0
Exported energy (thermal energy)	MJ	3.97	0	2.77	-	0	-	-	-	0	0	0	0	0	0	0

6.4 Interpretation, LCA presentation and critical verification

Evaluation

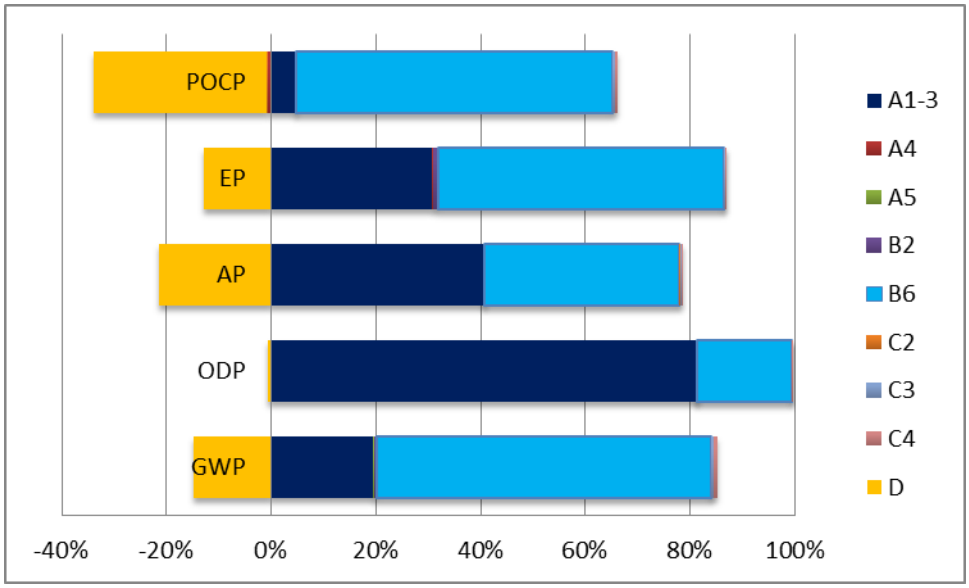


Figure 1: Distribution of environmental impacts

The essential environmental impacts of record system 20 occur during the manufacturing stage (modules A1 – A3), with aluminium and glass being the main contributors.
For the use stage, the modules B2 and B6 were examined; here the module B6 dominates as a result of the electricity consumed by the drive during the life cycle.

For scenario C4 only marginal consumption values arising from the physical pre-treatment and management of the disposal site are expected. Allocation to specific products is almost impossible for site disposal.

As regards the recycling of record system 20, almost two thirds of the environmental impacts occuring during manufacture can be assigned as benefits to scenario D.

The values obtained from the LCA calculation are suitable for the certification of buildings.

Report

The LCA underlying this EPD was developed according to the requirements set out in DIN EN ISO 14040 and DIN EN ISO 14044 as well as EN 15804 and EN ISO 14025. For reasons of confidentiality, it is not addressed to third parties. It is deposited with the ift Rosenheim. The results and conclusions reported to the target group are complete, correct, without bias and transparent. The results of the study are not designed to be used for comparative statements intended for publication.

Critical verification

The LCA was critically verified by Mr Florian Stich, an independent

ift verifier.

7 General information regarding the EPD

Comparability

This EPD was prepared in accordance with EN 15804 and is therefore only comparable with those EPDs that also comply with the requirements set out in EN 15804.
Any comparison must refer to the building context and the same boundary conditions of the various life cycle stages.
For comparing EPDs of construction products, the rules set out in EN 15804 (Clause 5.3) apply.

Communication

The communications format of this EPD meets the requirements of EN 15942:2011 and is therefore the basis for B2B communication. Only the nomenclature has been changed according to EN 15804.

Verification

Verification of the Environmental Product Declaration is documented in accordance with the ift "Richtlinie zur Erstellung von Typ III Umweltproduktdeklarationen" (Guidance on preparing Type III Environmental Product Declarations) in accordance with the requirements set out in EN ISO 14025.

This Declaration is based on the ift PCR document "Doors" (PCR-TT-1.1 : 2011).

The European standard EN 15804 serves as the core PCR[a)]
Independent verification of the declaration and statement according to EN ISO 14025:2010 ☒ internal ☐ external
Independent third party verifier: [b)] Florian Stich
[a)] Product category rules [b)] Optional for business-to-business communication, mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Revisions of this document

No.	Date	Note:	Practitioner of the LCA	Verifier
1	06.04.2016	First internal verification and approval	F. Stöhr	F. Stich
2				
3				

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[19] DIN EN 12457-3:2003-01
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8 Annex

Description of life cycle scenarios for record system 20

Product stage			Construction stage		Use stage							End-of-life stage				Benefits and loads beyond the system boundaries
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material supply	Transport	Manufacture	Transport	Construction/Installation	Use	Inspection, maintenance, cleaning	Repair	Exchange/Replacement	Improvement/Modernisation	Operational energy use	Operational water use	Deconstruction	Transport	Waste management	Disposal	Re-use Recovery Recycling potential
✓	✓	✓	✓	✓	–	✓	–	–	–	✓	–	–	✓	✓	✓	✓

Calculation of the scenarios was based on a service life of 10 years (in accordance with RSL indicated in Section 4 – Use stage).

The scenarios were based on information provided by the manufacturer. The scenarios were furthermore based on the research project “EPDs for transparent building components” [35].

Note: The standard scenarios selected are presented in bold type. They were also used for calculating the indicators in the summary table.

- ✓ Included in analysis
- — Excluded from analysis

A4 Transport to the construction site

No.	Scenario	Description
A4	Direct shipment to construction site/branch	40 t truck Euro 4, 80 percent capacity used, approx. 144 km to domestic construction site and return trip with 10 percent load Weight: 44.3 kg/m²

A5 Construction/Installation

No.	Scenario	Description
A5	Small lifting trolley/lifting platform	Small lifting platform/lifting trolley is required for the installation of record system 20. Installation includes the water used for initial cleaning.

In case of deviating consumption during installation/assembly of the products which forms part of the site management, they are covered at the building level.

Environmental impacts occur in the selected scenarios, resulting from the use of packaging material.

Benefits from A5 are not allocated to A5.

Waste is handled accordingly. It is assumed that the Installation module allocates the packaging material to waste handling. Waste is recycled partially:
Timber is disposed to site; unsorted plastics are thermally recycled.

B2 Inspection, maintenance, cleaning

B2.1 Cleaning

No.	Scenario	Description
B2.1	Rarely manual	Manually using suitable detergents, approx. 20 l of water, annually

Ancillary materials, consumables, energy use and waste as well as transport distances during cleaning are negligible (see summary table).

B2.2 Maintenance

No.	Scenario	Description
B2.2	Normal use	Annual functional check, visual inspection and, if necessary, repair.

Ancillary materials, consumables and waste materials as well as transport distances during maintenance are negligible. Fresh water and energy are not used for maintenance.

B6 Operational energy use

No.	Scenario	Description
B6	Power-operated Normal use	Per drive mechanism: 105 W/cycle (incl. standby mode) of electricity in 10 years --> 1 million cycles corresponds to 2,385 kWh in 10 years

Consumption in connection with operational energy use is given in the summary table.

C1 Deconstruction

No.	Scenario	Description
C1	Deconstruction	record system 20 99% deconstruction; The energy consumed during deconstruction is negligible. Any consumption arising is marginal.

No relevant inputs or outputs apply to the scenario selected.

C2 Transport

No.	Scenario	Description
C2	Transport	Transport to collecting point using 40 t truck, 80% capacity used, 50 km distance

C3 Waste management

No.	Scenario	Description
C3	Disposal	Deglazing (90%), recirculation of aluminium (82%), recirculation of remaining metals (82%) Residual fraction in waste incineration plant

The below table presents the disposal processes and their percentage by mass/weight. The calculation is based on the above mentioned shares in percent related to the declared unit of the product system.

C3 Disposal		
	Unit	**C3**
Collection process, collected separately	kg	0
Collection process, collected as mixed construction waste	kg	40.1
Recovery system, for re-use	kg	0
Recovery system, for recycling	kg	8.86
Recovery system, for energy recovery	kg	3.32
Disposal	kg	27.9
Assumptions for scenario development e.g. for transport	Appropriate units	-

C4 Disposal		
No.	**Scenario**	**Description**
C4	Disposal	The non-measurable quantities and losses of the re-use/recycling chain (C1 and C3) are modelled as “disposed”. The consumption is marginal and cannot be quantified.
The consumption in scenario C4 results from physical pre-treatment, waste recycling and management of the disposal site. The benefits obtained here from the substitution of primary material production are allocated to module D, e.g. electricity and heat from waste incineration.		

D Benefits and loads beyond the system boundaries (optional)		
No.	**Scenario**	**Description**
D	Recycling potential	Aluminium recyclate from C3.1 excluding the recyclate used in A3 replaces 100% of aluminium compound; Steel scrap from C3.1 excluding the scrap used in A3 replaces 100% of steel; Glass recyclate from C3.1 excluding the glass shards used in A3 replace 100% of glass; Benefits from waste incinerator: electricity replaces Switzerland electricity mix; thermal energy replaces thermal energy from natural gas

Imprint

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Notes
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