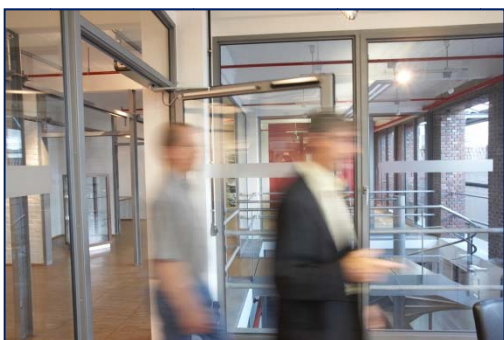


# Environmental Product Declaration (EPD)



Declaration code: EPD-DFA-22.1



agtatec ag

## “record DFA 127” swing door drive system



**Basis:**

DIN EN ISO 14025  
EN 15804

Company EPD  
Environmental  
Product Declaration

Publication date:  
06 April 2016

Next revision:  
06 April 2021



[www.ift-rosenheim.de/  
erstellte-epds](http://www.ift-rosenheim.de/erstellte-epds)

# Environmental Product Declaration (EPD)



Declaration code: EPD-DFA-22.1

<b>Programme operator</b>	ift Rosenheim GmbH Theodor Gietl Straße 7-9 D-83026 Rosenheim		
<b>Practitioner of the LCA</b>	ift Rosenheim GmbH Theodor Gietl Straße 7-9 D-83026 Rosenheim		
<b>Declaration holder</b>	agtatec ag Allmendstrasse 24 CH 8320 Fehraltorf		
<b>Declaration code</b>	EPD-DFA-22.1		
<b>Designation of declared product</b>	"record DFA 127" automatic drive system for swing doors		
<b>Scope</b>	Universally applicable drive system for the automation of single and double leaf swing doors for internal applications.		
<b>Basis</b>	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 "Drive units for windows and doors" (PCR-AFT-1.0:2013).		
<b>Validity</b>	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.		
<b>LCA basis</b>	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.).		
<b>Notes</b>	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 “drives” and applies to the product:

**“record DFA 127” automatic drive system from the company agtatec ag, designed for swing doors**

The LCA was prepared using the declared unit:

**1 piece**

This functional unit is declared as follows:

**1 pc. = 11.7 kg**

Directly used material flows are assigned to the functional unit. All other inputs and outputs of “record DFA 127” 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 2015.

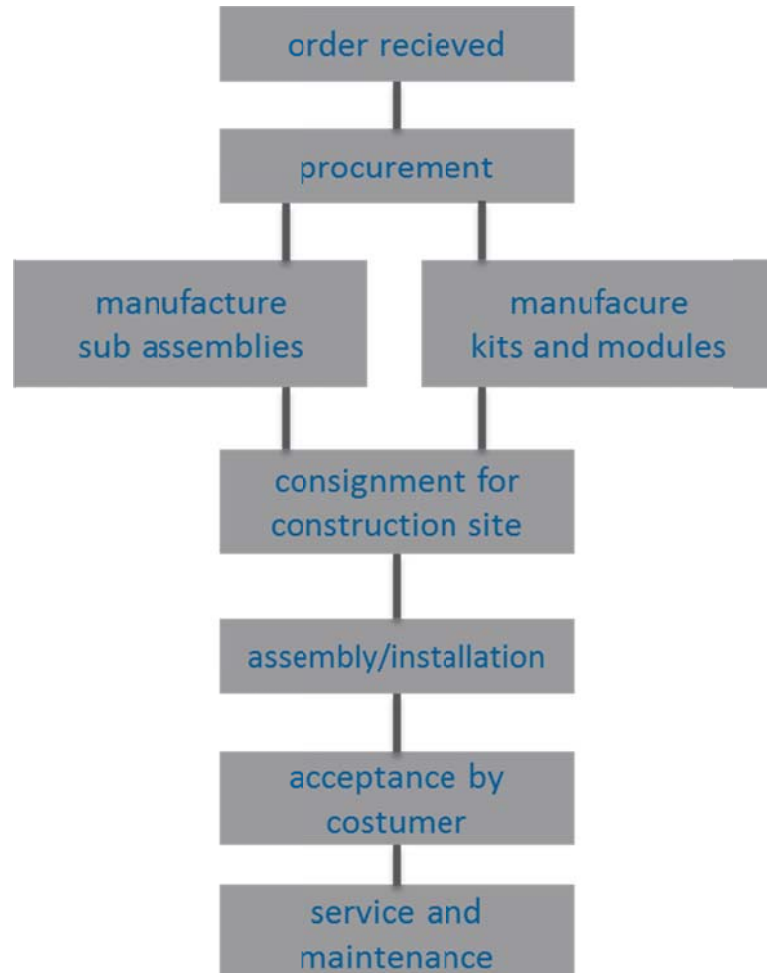
### Product description

“record DFA 127” automatic drive system for swing doors:

- The electromechanical drives are characterised by tried-and-tested technology, compact design and particular smoothness of operation.
- The modular design allows a broad range of applications, with the adjustable spring force and flexible programming options offering a broad range of solutions for widely differing requirements.
- Whether slim and 85 mm high, or 108 mm with integrated mechanical door coordination – the attractively designed drive integrates seamlessly into your door.
- The standard arm with pushing action is able to compensate different lintel depths, while the sliding arm with pulling or pushing action meets aesthetic requirements to perfection.
- The operating switch is used to select either “automatic”, “continuously open” or “manual” operating mode. The side cover also integrates an LED display and a reset button.
- The interactive communication enabled by CAN bus technology between the “record” sensors and the door control guarantees high reliability and maximum user safety.

For a detailed product description refer to the manufacturer specifications at [www.record.global](http://www.record.global) or the product descriptions for the desired product.

## Product manufacture



## Application

Universally applicable drive system for the automation of single and double leaf swing doors for internal applications.

- Full Power for heavy doors, Low Energy and Power Assist for smooth opening of accessible “barrier-free” passages
- Approved as hold-open system for fire door assemblies with infinitely adjustable closing force from EN 4 to 6 in accordance with EN 1154
- Inverse operation for currentless opening in smoke and heat exhaust ventilation systems
- Interlock operation for two single doors or in combination with a sliding door

**Verification**

The following verifications are held:

The drive system “record DFA 127” 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/EC
- EMC Directive 2004/108/EC

The following harmonised standards are applied:

- DIN EN 16005:2013
- DIN 18650-1/-2:2010
- EN 1154
- EN ISO 13849-1:2008
- DIN EN 60335-2-103:2010 in combination with  
DIN EN 16005:2013

**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**

The system “record DFA 127” allows a great variety of door designs to be implemented, in some cases permitting combinations of characteristics pertaining to the following to be achieved, depending on the place of application and the specific requirements:

- Use on escape and emergency exit routes
- Fire safety
- Smoke leakage
- Low energy
- Assisted opening with Power Assist
- Air permeability
- Sound insulation

**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](http://www.record.global)

**4 Use stage****Emissions to the environment**

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



**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 the 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](http://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 “record DFA 127” 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)
- Assumed quality of work: see Section 4 (Construction process stage - Processing recommendations) and Section 1 (General product information - Application)
- Outdoor environment: not designed for outdoor use
- 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.

The 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 DFA 127” is shipped to central collection 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 “record DFA 127”. 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 “record DFA 127”. 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 Fehrltorf 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 2015. 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 “GaBi ts” sustainability software system for the development of Life Cycle Assessments.

<b>Scope/system boundaries</b>	<p>The system boundaries refer to the supply of raw materials and purchased parts, manufacture/production, use and end-of-life stage of “record DFA 127” (cradle to gate with options). No additional data from pre-suppliers/subcontractors or other sites were taken into consideration.</p>
<b>Cut-off criteria</b>	<p>All company data collected, i.e. all commodities/input and raw materials used, the thermal energy and electricity consumption, were taken into consideration.</p> <p>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.</p> <p>The transport distances of the primary products/pre-products were taken into consideration as a function of at least 99% of the mass of “record DFA 127”.</p> <p>The remaining transport distances of the primary products/pre-products to the plant in Fehraltorf were not taken into consideration.</p> <p>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.</p>
<b>6.2 Inventory analysis</b>	
<b>Goal</b>	<p>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.</p>
<b>Life cycle stages</b>	<p>The Annex illustrates the entire life cycle of “record DFA 127”. The modules are shown as described in the Annex.</p>
<b>Benefits</b>	<p>The following benefits have been defined as per EN 15804:</p> <ul style="list-style-type: none"><li>• Benefits from recycling</li><li>• Benefits (thermal and electrical) from incineration</li></ul>
<b>Allocation procedures</b> <b>Allocation of co-products</b>	<p>The manufacture of “record DFA 127” does not produce any allocations.</p>
<b>Allocations for re-use, recovery and recycling</b>	<p>If “record DFA 127” 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 DFA 127” were set following their disposal, with termination of their waste characteristics.</p>



**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 material 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**

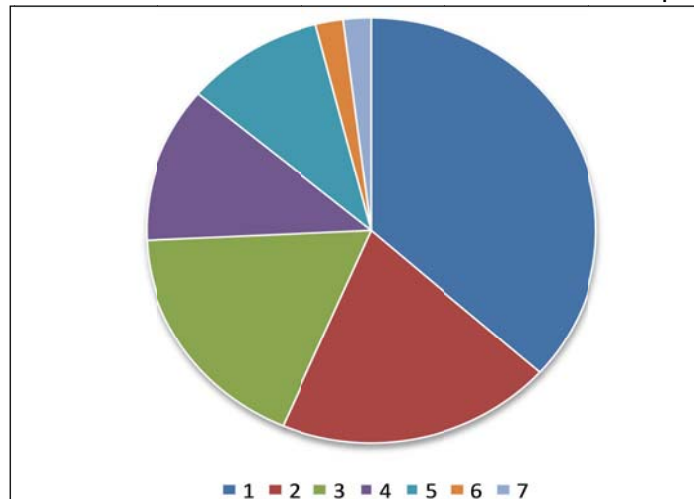
The electricity mix is based on "Switzerland electricity mix".

**Water**

The water consumed by the individual process steps for the manufacture of "record DFA 127" amounts to a total of 0.2 l per pc. 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 shows the share of raw materials/pre-products in %.



No.	Material	Mass in %
1	Steel	37
2	Electric motor	20
3	Other metals	18
4	Aluminium	12
5	Transformer	10
6	Plastics	2
7	Other	2

**Table 1: Share of individual materials in percent**

**Outputs**

The LCA includes the following production-relevant outputs per “record DFA 127”:

**Waste**

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

**Waste water**

The manufacture of one “record DFA 127” produces 0.2 l of waste water.

**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 evaluation of the waste generated during the manufacture of one “record DFA 127” is shown separately for each of the three 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 primary products/pre-products. The wastes presented are generated throughout the entire product life cycle.

## Product group: Drives

Results for 1 x "record DFA 127" (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 <sub>2</sub> -equiv.	58.7	0.0909	1.07	-	0	-	-	-	63.8	0	0	0.0295	0.343	7.26	-8.65
Ozone depletion potential of stratospheric layer (ODP)	kg R11-equiv.	7.41E-06	4.18E-13	5.77E-11	-	0	-	-	-	1.59E-07	0	0	1.36E-13	2.43E-10	1.71E-11	-2.30E-09
Acidification potential of soil and water (AP)	kg SO <sub>2</sub> -equiv.	0.411	5.53E-04	2.62E-04	-	0	-	-	-	0.116	0	0	1.80E-04	9.54E-04	1.53E-03	-3.47E-02
Eutrophication potential (EP)	kg PO <sub>4</sub> <sup>3</sup> -equiv.	2.74E-02	1.39E-04	2.32E-04	-	0	-	-	-	0.0177	0	0	4.50E-05	8.53E-05	4.91E-03	-2.27E-03
Formation potential of tropospheric ozone photo-chemical oxidants (POCP)	kg C <sub>2</sub> H <sub>4</sub> -equiv.	0.035	-2.30E-04	6.58E-05	-	0	-	-	-	8.92E-03	0	0	-7.47E-05	6.57E-05	1.23E-03	-2.63E-03
Abiotic depletion potential - non-fossil resources (ADP - elements)	kg Sb-equiv.	2.44E-03	6.05E-09	5.41E-08	-	0	-	-	-	6.81E-05	0	0	1.96E-09	1.12E-07	7.62E-08	-3.14E-06
Abiotic depletion potential - fossil fuels (ADP - fossil resources)	MJ	524	1.25	0.615	-	0	-	-	-	601	0	0	0.406	3.71	4.76	-100
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 renewable primary energy resources used as raw materials	MJ	93.2	0	0	-	0	-	-	-	0	0	0	0	0	0	0
Use of renewable primary energy resources used as raw materials (material use)	MJ	13	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	106	0.0711	0.505	-	0	-	-	-	1250	0	0	0.0231	1.67	0.372	-35.3
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials.	MJ	584	0	0	-	0	-	-	-	0	0	0	0	0	0	0
Use of non-renewable primary energy resources used as raw materials (material use)	MJ	14	0	0	-	0	-	-	-	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources (primary energy and non-renewable primary energy resources used as raw materials) (energy + material use)	MJ	598	1.26	1.25	-	0	-	-	-	2280	0	0	0.408	5.97	5	-118
Use of secondary materials	kg	0	0	0	-	0	-	-	-	0	0	0	0	0	0	0

Product group: Drives

Results for 1 x "record DFA 127" (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	-0.0608	4.09E-06	1.46E-04	-	0	-	-	-	0.0637	0	0	1.33E-06	6.97E-05	3.43E-03	6.12E-03
Use of non-renewable secondary fuels	MJ	-0.958	6.22E-05	6.36E-04	-	0	-	-	-	0.965	0	0	2.02E-05	1.05E-03	7.21E-03	0.103
Use of net fresh water	m <sup>3</sup>	0.333	1.78E-04	3.18E-03	-	0	-	-	-	1.74	0	0	5.78E-05	2.58E-03	0.006	-0.0916
Waste categories	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D*)
Hazardous waste disposed	kg	4.11E-06	9.50E-08	2.79E-09	-	0	-	-	-	1.88E-06	0	0	3.08E-08	3.79E-09	3.23E-08	-9.82E-08
Non-hazardous waste disposed (municipal waste)	kg	4.35	1.06E-04	0.176	-	0	-	-	-	2.96	0	0	3.43E-0	3.60E-03	4.82	-1.6
Radioactive waste	kg	0.0267	1.80E-06	2.45E-04	-	0	-	-	-	0.648	0	0	5.83E-07	9.01E-04	9.29E-05	-6.95E-03
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	2.13	0	0
Materials for energy recovery	kg	0	0	0	-	0	-	-	-	0	0	0	0	0.797	0	0
Exported energy (electricity)	MJ	0.864	0	1.17	-	0	-	-	-	0	0	0	0	0	0	0
Exported energy (thermal energy)	MJ	1.99	0	2.77	-	0	-	-	-	0	0	0	0	0	0	0

## 6.4 Interpretation, LCA presentation and critical verification

### Evaluation

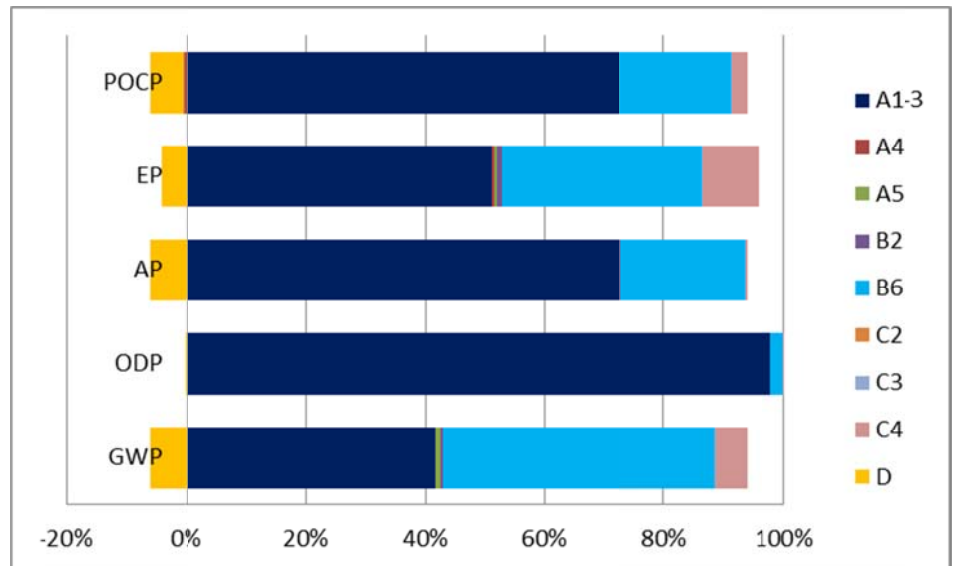


Figure 1: Distribution of environmental impacts

The manufacture of the pre-products/primary products has the largest effect on the environmental impact during the product stage. The main reason is the aluminium used.

The dominating module in the use stage is module B6 (Energy consumption during use) for the product's entire 10-year service life.

The benefits in module D can likewise be allocated mainly to aluminium. Transport by ship or truck accounts for only a minor share of the environmental impacts.

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.

**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; 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 "Drive units for windows and doors" (PCR-AFT-1.0:2013).

The European standard EN 15804 serves as the core PCR <sup>a)</sup>
Independent verification of the declaration and statement according to EN ISO 14025:2010 <input checked="" type="checkbox"/> internal <input type="checkbox"/> external
Independent third party verifier: <sup>b)</sup> Florian Stich
<sup>a)</sup> Product category rules <sup>b)</sup> 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				



## Bibliography

- [1] Ökologische Bilanzierung von Baustoffen und Gebäuden – Wege zu einer ganzheitlichen Bilanzierung (LCA of building materials and buildings - Routes to integrated LCA)  
Published by: Eyerer, P., Reinhardt, H.-W.  
Birkhäuser Verlag, Basel, 2000
- [2] Leitfaden Nachhaltiges Bauen (Guidance on Sustainable Building).  
Published by: German Federal Ministry of Transport, Building and Housing.  
Berlin, 2013
- [3] GaBi 6: Software und Datenbank zur Ganzheitlichen Bilanzierung (Gabi 6: Software and database for LCA)  
Published by: IKP Universität Stuttgart and PE Europe GmbH.  
Leinfelden-Echterdingen, 1992 – 2014
- [4] Ökobilanzen (LCA).  
Klöpper, W.; Grahl, B.  
Wiley-VCH-Verlag, Weinheim, 2009
- [5] EN 15804:2012+A1:2013  
Sustainability of construction works - Environmental product declarations - Rules for the product categories.  
Beuth Verlag GmbH, Berlin
- [6] EN 15942:2011  
Sustainability of construction works – Environmental product declaration – Communication format business-to-business  
Beuth Verlag GmbH, Berlin
- [7] ISO 21930:2007-10  
Sustainability in building construction - Environmental declaration of building products  
Beuth Verlag GmbH, Berlin
- [8] EN ISO 14025:2011-10  
Environmental labels and declarations - Type III environmental declarations - Principles and procedures.  
Beuth Verlag GmbH, Berlin
- [9] EN ISO 16000-9:2006-08  
Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method  
Beuth Verlag GmbH, Berlin
- [10] EN ISO 16000-11:2006-08  
Indoor air - Part 11: Determination of the emission of volatile organic compounds from building products and furnishing - Sampling, storage of samples and preparation of test specimens.  
Beuth Verlag GmbH, Berlin
- [11] DIN ISO 16000-6:2004-08  
Indoor air - Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA® sorbent, thermal desorption and gas chromatography using MS/FID.  
Beuth Verlag GmbH, Berlin
- [12] DIN EN ISO 14040:2009-11  
Environmental management - Life cycle assessment - Principles and framework.  
Beuth Verlag GmbH, Berlin
- [13] DIN EN ISO 14044:2006-10  
Environmental management - Life cycle assessment - Requirements and guidelines.  
Beuth Verlag GmbH, Berlin
- [14] prEN 14351-2:2009-05  
Windows and doors - Product standard, performance characteristics - Part 2: Internal pedestrian doorsets without resistance to fire and/or smoke leakage characteristics.  
Beuth Verlag GmbH, Berlin
- [15] prEN 16034:2010-01  
Pedestrian doorsets, industrial, commercial, garage doors and windows - Product standard, performance characteristics - Fire resistance and/or smoke control characteristics.  
Beuth Verlag GmbH, Berlin
- [16] DIN EN 12457-1:2003-01  
Characterization of waste - Leaching; Compliance test for leaching of granular waste materials and sludges - Part 1: One stage batch test at a liquid to solid ratio of 2 l/kg and with particle size below 4 mm (without or with size reduction)  
Beuth Verlag GmbH, Berlin
- [17] DIN EN 12457-2:2003-01  
Characterization of waste - Leaching; Compliance test for leaching of granular waste materials and sludges - Part 2: One stage batch test at a liquid to solid ratio of 10 l/kg and with particle size below 4 mm (without or with size reduction)  
Beuth Verlag GmbH, Berlin
- [18] DIN EN 12457-3:2003-01  
Characterization of waste - Leaching; Compliance test for leaching of granular waste materials and sludges - Part 3: Two stage batch test at a liquid to solid ratio of 2 l/kg and 8 l/kg for materials with high solid content with particle size below 4 mm (without or with size reduction).  
Beuth Verlag GmbH, Berlin

## Product group: Drives

- [19] DIN EN 12457-4:2003-01  
Characterization of waste - Leaching; Compliance test for leaching of granular waste materials and sludges - Part 4: One stage batch test at a liquid to solid ratio of 10 l/kg for materials with particle size below 10 mm (without or with size reduction)  
Beuth Verlag GmbH, Berlin
- [20] DIN EN 13501-1:2010-01  
Fire classification of construction products and building elements –  
Part 1: Classification using test data from reaction to fire tests.  
Beuth Verlag GmbH, Berlin
- [21] DIN EN 14351-1:2010-08  
Windows and doors - Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics.  
Beuth Verlag GmbH, Berlin
- [22] DIN 4102-1:1998-09  
Fire behaviour of building materials and building components - Part 1: Building materials; concepts, requirements and tests.  
Beuth Verlag GmbH, Berlin
- [23] OENORM S 5200:2009-04-01  
Radioactivity in construction materials.  
Beuth Verlag GmbH, Berlin
- [24] DIN/CEN TS 14405:2004-09  
Characterization of waste - Leaching behaviour tests - Up-flow percolation test (under specified conditions).  
Beuth Verlag GmbH, Berlin
- [25] VDI 2243:2002-07  
Recycling-oriented product development.  
Beuth Verlag GmbH, Berlin
- [26] Commission Directive 2009/2/EC  
amending, for the purpose of its adaptation to technical progress, for the 31st time, Council Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances (15 January 2009).
- [27] ift Guideline NA-01/3  
Allgemeiner Leitfaden zur Erstellung von Typ III Umweltproduktdeklarationen (Guidance on preparing Type III Environmental Product Declarations).  
ift Rosenheim, August 2014
- [28] Arbeitsschutzgesetz – ArbSchG (Safety at Work Law)  
Gesetz über die Durchführung von Maßnahmen
- des Arbeitsschutzes zur Verbesserung der Sicherheit und des Gesundheitsschutzes der Beschäftigten bei der Arbeit (Law on the implementation of occupational health and safety measures to improve the safety and health protection of employees at work), 5 February 2009 (BGBl. I p.160, 270)
- [29] Bundesimmissionsschutzgesetz – BImSchG (Federal Immission Law)  
Gesetz zum Schutz vor schädlichen Umwelteinwirkungen durch Luftverunreinigungen, Geräusche, Erschütterungen und ähnlichen Vorgängen (Law on harmful environmental impacts by air contamination, noise, vibrations and similar processes), 26 September 2002 (BGBl. I p. 3830)
- [30] Chemikaliengesetz – ChemG (Chemicals Act)  
Gesetz zum Schutz vor gefährlichen Stoffen (Law on protection against hazardous substances) – subdivided into Chemicals Act and a series of regulations; of relevance here: Gesetz zum Schutz vor gefährlichen Stoffen (Law on protection against hazardous substances), 2 July 2008 (BGBl. I p. 1146)
- [31] Chemikalien-Verbotsverordnung – ChemVerbotsV (Chemicals Prohibition Regulation)  
Verordnung über Verbote und Beschränkungen des Inverkehrbringens gefährlicher Stoffe, Zubereitungen und Erzeugnisse nach dem Chemikaliengesetz (Regulation on bans and restrictions of the placing on the market of hazardous substances, formulations and products covered by the Chemicals Act), 21 July 2008 (BGBl. I p. 1328)
- [32] Gefahrstoffverordnung – GefStoffV (Hazardous substances regulation)  
Verordnung zum Schutz vor Gefahrstoffen (Regulation on protection against hazardous substances), 23 December 2004 (BGBl. I p. 3758)
- [33] PCR Drive units for windows and doors. Product Category Rules as per ISO 14025 and EN 15804.  
ift Rosenheim, July 2013
- [34] Research project: “EPDs für transparente Bauelemente” (EPDs for transparent building components).  
ift Rosenheim, 2011
- [35] Electric motors for mobile applications, Study EMPA, TSL Technology and Society Lab @ EMPA  
Schweizerische Materialprüfungs- und Forschungsanstalt (Swiss Federal Laboratories for Materials Science and Technology)

## 8 Annex

### Description of life cycle scenarios for “record DFA 127”

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” [34].

**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: 12.5 kg

**A5 Construction/Installation**

No.	Scenario	Description
A5.1	Manually	"record DFA 127" drive systems are installed without the use of additional lifting devices.

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 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 cleaning required

### B2.2 Maintenance

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

The selected scenario does not produce any environmental impacts. 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: 20 W/cycle (incl. standby mode) of electricity in 10 years --> 1 million cycles Corresponds to 420 kWh in 10 years

There is no consumption arising from transport in connection with energy use in buildings. Ancillary materials, consumables and waste materials as well as transport distances are negligible.

## Product group: Drives

**C1 Deconstruction**

No.	Scenario	Description
C1	Deconstruction	Swing door drive, 99% deconstruction; The energy consumed during deconstruction is negligible. Any consumption arising is marginal.

No relevant inputs or outputs apply to the scenario selected.

In case of deviating consumption the deconstruction of the products forms part of the site management and is covered at the building level.

**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	Recirculation of aluminium (93%), recirculation of remaining metals (93%) 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	-
Collection process, collected as mixed construction waste	kg	11.7
Recovery system, for re-use	kg	-
Recovery system, for recycling	kg	4.12
Recovery system, for energy recovery	kg	1.7
Disposal	kg	5.9
Assumptions for scenario development e.g. for transport	Appropriate units	-



<b>C4 Disposal</b>		
<b>No.</b>	<b>Scenario</b>	<b>Description</b>
<b>C4</b>	Disposal	The non-measurable quantities and losses of the reuse/recycling chain (C1 and C3) are modelled as "disposed".
<p>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.</p>		
<b>D Benefits and loads beyond the system boundaries (optional)</b>		
<b>No.</b>	<b>Scenario</b>	<b>Description</b>
<b>D</b>	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; Benefits from waste incinerator: electricity replaces Switzerland electricity mix; thermal energy replaces thermal energy from natural gas
<p>The values in module D result from one-time replacement of the components from scenario B4 during service life and from deconstruction at the end of service life.</p>		

## **Imprint**

### **Practitioner of the LCA**

ift Rosenheim GmbH  
Theodor Gietl Straße 7-9  
D-83026 Rosenheim

### **Programme operator**

ift Rosenheim GmbH  
Theodor-Gietl-Str. 7-9  
D-83026 Rosenheim  
Phone: +49 (0) 0 80 31/261-0  
Fax: +49 (0) 0 80 31/261 290  
email: info@ift-rosenheim.de  
www.ift-rosenheim.de

### **Declaration holder**

agtatec ag  
Allmendstrasse 24  
CH 8320 Fehraltorf

### **Notes**

This EPD is mainly based on the work and findings of the Institut für Fenstertechnik e.V., Rosenheim (ift Rosenheim) and specifically on the ift-Richtlinie NA-01/3 Allgemeiner Leitfaden zur Erstellung von Typ III Umweltproduktdeklarationen (Guideline NA.01/3 - Guidance on preparing Type III Environmental Product Declarations).

The publication and all its parts are protected by copyright. Any utilisation outside the confined limits of the copyright provisions is not permitted without the consent of the publishers and is punishable. In particular, this applies to any form of reproduction, translations, storage on microfilm or storage and processing in electronic systems.

### **Layout**

ift Rosenheim GmbH, 2015

### **Photographs (front page)**

agtatec ag

© ift Rosenheim, 2015



ift Rosenheim GmbH  
Theodor-Gietl-Str. 7-9  
D-83026 Rosenheim  
Phone: +49 (0) +49 (0) 80 31/261-0  
Fax: +49 (0) +49 (0) 80 31/261-290  
email: [info@ift-rosenheim.de](mailto:info@ift-rosenheim.de)  
[www.ift-rosenheim.de](http://www.ift-rosenheim.de)