

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	dormakaba International Holding GmbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
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Valid to	14.03.2028

Automatic Sliding Door ST FLEX Green dormakaba

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EPD
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General Information

dormakaba

Programme holder

IBU – Institut Bauen und Umwelt e.V.
 Hegelplatz 1
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 Germany

Declaration number

EPD-DOR-20220359-CBA4-EN

This declaration is based on the product category rules:

Automatic doors, automatic gates, and revolving door systems,
 01.08.2021
 (PCR checked and approved by the SVR)

Issue date

15.03.2023

Valid to

14.03.2028

[Unterschrift]

Dipl.-Ing. Hans Peters
 (Chairman of Institut Bauen und Umwelt e.V.)

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Automatic Sliding Door ST FLEX Green

Owner of the declaration

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Declared product / declared unit

The declared unit is one piece (1 pc.) of the ST FLEX Green automatic sliding door system without drive comprising:

- ST FLEX Green sliding panels,
- ST FLEX Green side screens and
- product packaging

Scope:

This EPD refers to the entire life cycle of a specific ST FLEX Green automatic sliding door system.
 The production location is dormakaba Zusmarshausen, Germany. Green electricity is used at the production facility. The material and energy flows were taken into consideration accordingly.

The year of data collection is 2022.

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*.

Verification

The standard EN 15804 serves as the core PCR	
Independent verification of the declaration and data according to ISO 14025:2011	
<input type="checkbox"/>	internally
<input checked="" type="checkbox"/>	externally

[Unterschrift]

Dr.-Ing. Wolfram Trinius,
 (Independent verifier)

Product

Product description/Product definition

The ST FLEX Green stands for an automatic sliding door system manufactured by dormakaba. dormakaba underlines its contribution to more energy efficiency and more sustainability with the sliding door ST FLEX Green. The automatic sliding door has a slim, thermal divided profile system on basis of the ST FLEX profile.

Therefore, heat insulation is achieved without compromising in the slim profile. ST FLEX Green makes considerable savings of the running energy and heating costs possible, as well as a reduction in CO₂- emissions for the entire use phase.

To meet all requirements, the ST FLEX Green system can be combined with different ES operator versions, among others ES PROLINE and ES 200. For the Sliding Door ST Flex Green the standards which can be applied are the following:

- EN 16005
- DIN 18650-1/ -2
- ISO 13849-1
- EN 60335-1
- EN 60335-2-103
- IEC 60335-2-103
- 2011/65/EU (RoHS)

Application

The ST FLEX Green automatic sliding door system is used in particular where energy saving enjoys key significance during the reference service life. Each system is manufactured to the individual dimensions of the respective building project.

Technical Data

Following data are applicable for the sliding panels and side screens:

- Heat transition coefficient (U-value) for the sliding door system measuring 6250 x 3305: 1,4 [W/m²K]
- Heat transition coefficient (U-value) for the sliding door system measuring 2100 x 2205: 1,6 [W/m²K]
- Insulation glass units: 1,0 [W/m²K]

Base materials/Ancillary materials

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision which can be applied are mentioned above. The ST FLEX Green Automatic Sliding Door comprises the following components including packaging:

Components	Percentage
Glass	81%
Aluminium	12%
Steel	1%
Plastics	6%
Total	100%

The product contains partial articles which contain substances listed in the Candidate List of REACH Regulation 1907/2006/EC (date: 17.01.2023) exceeding 0.1 percentage by mass: no

The Candidate List can be found on the ECHA website address: <https://echa.europa.eu/de/home>.

Reference service life

The reference service life amounts to 10 years, depending on the application and frequency of use. Regular maintenance is advised to ensure the life expectancy of 10 years. For repairs and renewals, suitable spare parts are available. The ST FLEX Green is tested and certified, meaning they are designed to withstand a minimum of 1.000.000 cycles.

LCA: Calculation rules

Declared Unit

The declared unit is 1 piece of the product: Automatic Sliding Door ST FLEX Green

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	pce.
Mass (total system)	287.43	kg

System boundary

The type of EPD is: cradle-to-gate with options, modules C1–C4, and module D (A1–A3 + C + D and additional modules: A4 + A5 + B6)

Production - Module A1-A3

The product stage includes:

- A1, raw material extraction, processing and mechanical treatments, processing of secondary material input (e.g. recycling processes),
- A2, transport to the manufacturer,
- A3, manufacturing and assembly including provision of all materials, products and energy, as well as waste processing up to the end-of waste state.

Construction stage - Modules A4-A5

The construction process stage includes:

- A4, transport to the building site;
- A5, installation into the building; including provision of all materials, products and energy, as well as waste processing up to the end-of waste state or disposal of final residues during the construction process stage.

Use stage - Module B6

The use stage related to the operation of the building includes:

- B6, operational energy use

End-of-life stage– Modules C1-C4 and D

The end-of-life stage includes:

- C1, de-construction, demolition;
 - C2, transport to waste processing;
 - C3, waste processing for reuse, recovery and/or recycling;
 - C4, disposal; including provision and all transport, provision of all materials, products and related energy and water use.
- Module D (Benefits and loads beyond the system boundary) includes:
- D, recycling potentials, expressed as net impacts and benefits.

Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product's lifespan: Global

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. Background database: GaBi, SP40.

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in accompanying packaging	0.003	kg C

The following technical scenario information is required for the declared modules.

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel (per 1 kg)	0.00276	l/100km
Transport distance via medium truck	100	km
Capacity utilisation (including empty runs)	55	%

Transport distance is declared for a distance of 100km by truck in order to allow scaling to a specific point of installation.

Installation into the building (A5)

Name	Value	Unit
Waste packaging (paper and plastic)	9	kg

Reference service life

Name	Value	Unit
Life Span according to the manufacturer	10	a

Operational energy use (B6)

The drive unit is not included in this EPD, which is why B6 is not declared. The results for the drive unit are shown in a separate EPD.

End of life (C1-C4)

C1: The product expansion depends on the building. The product share is so low that no environmental burden is assumed.

C2: Transport to waste treatment at end of life is 50km.

Name	Value	Unit
Collected separately waste type waste type	278	kg
Reuse	-	kg
Recycling	36.4	kg
Energy recovery	7.59	kg
Landfilling	234	kg
Transport to waste management	50	km

The product is disassembled in a recycling process. Material recycling is then assumed for the metals, electronics and electromechanics. The plastic components are assumed to be incinerated with energy recovery. Glass and minor proportions of residues arising from the recycling process are landfilled. Region for the End of Life is: Global.

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

The collection rate is 100%.

Name	Value	Unit
Recycling	100	%

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

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	Refurbishment	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	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 piece Automatic Sliding Door ST FLEX Green

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq	5.1E+02	2.51E+00	2.29E+01	0	1.22E+00	1.93E+01	3.58E+00	-6.37E+01
GWP-fossil	kg CO ₂ eq	5.07E+02	2.4E+00	2.29E+01	0	1.16E+00	1.93E+01	3.56E+00	-6.35E+01
GWP-biogenic	kg CO ₂ eq	2.25E+00	1.11E-01	5.33E-04	0	5.4E-02	4.5E-04	1.2E-02	-1.79E-01
GWP-luluc	kg CO ₂ eq	1.97E-01	5.72E-05	1E-03	0	2.77E-05	1E-03	1E-02	-2E-02
ODP	kg CFC11 eq	3.11E-09	2.54E-16	1.15E-14	0	1.23E-16	9.73E-15	1.32E-14	-3.36E-10
AP	mol H ⁺ eq	3.35E+00	2E-03	4E-03	0	1E-03	3E-03	2.6E-02	-1.89E-01
EP-freshwater	kg P eq	4.72E-04	5.14E-07	1.84E-06	0	2.49E-07	1.55E-06	6.11E-06	-4.49E-05
EP-marine	kg N eq	7.46E-01	7.65E-04	9.18E-04	0	3.71E-04	7.75E-04	7E-03	-2.8E-02
EP-terrestrial	mol N eq	8.5E+00	9E-03	1.9E-02	0	4E-03	1.6E-02	7.2E-02	-3.08E-01
POCP	kg NMVOC eq	1.62E+00	2E-03	3E-03	0	1E-03	2E-03	2E-02	-8.8E-02
ADPE	kg Sb eq	2.46E-04	7.21E-08	1.58E-07	0	3.49E-08	1.34E-07	3.19E-07	-6.18E-05
ADPF	MJ	7.32E+03	3.41E+01	1.06E+01	0	1.65E+01	8.95E+00	4.67E+01	-9.55E+02
WDP	m ³ world eq deprived	3.07E+01	5E-03	2.34E+00	0	2E-03	1.97E+00	3.73E-01	-3.98E+00

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 - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 piece Automatic Sliding Door ST FLEX Green

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	7.88E+02	1.07E-01	2.76E+00	0	5.2E-02	2.33E+00	6.11E+00	-3.52E+02
PERM	MJ	0	0	0	0	0	0	0	0
PERT	MJ	7.88E+02	1.07E-01	2.76E+00	0	5.2E-02	2.33E+00	6.11E+00	-3.52E+02
PENRE	MJ	6.77E+03	3.41E+01	3.98E+02	0	1.65E+01	1.73E+02	4.67E+01	-9.56E+02
PENRM	MJ	5.51E+02	0	-3.87E+02	0	0	-1.64E+02	0	0
PENRT	MJ	7.32E+03	3.41E+01	1.06E+01	0	1.65E+01	8.95E+00	4.67E+01	-9.56E+02
SM	kg	2.86E+01	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m ³	1.75E+00	1.93E-04	5.6E-02	0	9.34E-05	4.7E-02	1.2E-02	-5.83E-01

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 - WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 piece Automatic Sliding Door ST FLEX Green

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	1.26E-05	3.31E-09	4.04E-08	0	1.6E-09	3.41E-08	7.11E-07	-2.51E-06
NHWD	kg	6.46E+01	3E-03	2.38E+00	0	2E-03	2E+00	2.35E+02	-1.12E+01
RWD	kg	1.6E-01	3.66E-05	3.94E-04	0	1.77E-05	3.32E-04	5.31E-04	-9E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	9.16E+00	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	0	0	4.24E+01	0	0	0	0	0

EET	MJ	0	0	9.73E+01	0	0	0	0	0
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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; EET = Exported thermal energy

**RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:
1 piece Automatic Sliding Door ST FLEX Green**

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	2.1E-05	1.26E-08	5.2E-08	0	6.12E-09	4.38E-08	3.16E-07	-2.86E-06
IR	kBq U235 eq	2.63E+01	5E-03	3.5E-02	0	3E-03	3E-02	5.5E-02	-1.74E+01
ETP-fw	CTUe	8.57E+03	2.42E+01	3.98E+00	0	1.17E+01	3.36E+00	2.67E+01	-2.93E+02
HTP-c	CTUh	2.66E-07	4.54E-10	3.45E-10	0	2.2E-10	2.91E-10	3.95E-09	-1.46E-08
HTP-nc	CTUh	4.89E-06	1.94E-08	3.49E-08	0	9.41E-09	2.94E-08	4.35E-07	-4.32E-07
SQP	SQP	4.19E+02	8.8E-02	3.18E+00	0	4.2E-02	2.68E+00	9.73E+00	-6.51E+01

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.

References

Standards

DIN 18650-1

DIN 18650-1: 2010-06, Powered pedestrian doors –Part 1: Product requirements and test methods.

DIN 18650-2

DIN 18650-2:2010-06, Powered pedestrian doors –Part 2: Safety at powered pedestrian doors.

EN 15804

EN 15804:2012-04, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products; German version EN 15804:2012.

EN 16005

EN 16005:2013-01, Power operated pedestrian doorsets - Safety in use - Requirements and test methods; German version EN 16005:2012

EN 60335-1

EN 60335-1; VDE 0700-1:2012-10:2012-10, Household and similar electrical appliances – Safety - Part 1: General requirements (IEC 60335-1:2010, modified); German version EN 60335-1:2012.

EN 60335

EN 60335-2-103/A1; Household and similar electrical appliances - Safety - Part 2-103: Particular requirements for drives for gates, doors and windows (IEC 61/2863/CDV:2005); German version EN 60335-2-103:2003/prA1:2005.2011/65/EU

ISO 13849-1

ISO 13849-1:2008-12, Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design (ISO 13849-1:2006.

ISO 14025

DIN EN ISO 14025:201110, Environmental labels and

declarations — Type III environmental declarations — Principles and procedures

Further References

European Chemicals Agency (ECHA)

<https://echa.europa.eu/de/home>

GaBi ts software

Sphera Solutions GmbH Gabi Software System and Database for Life CyclenEngineering 1992-2020 Version 10.0.0.71 University of Stuttgart Leinfelden-Echterdingen

GaBi ts documentation

GaBi life cycle inventory data documentation (<https://www.gabisoftware.com/support/gabi/gabidatabase-2020-lci-documentation/>).

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

LCA-tool dormakaba

LCA tool, ENS doors LCA tool no.: BU-DOR-202107-LT1-EN Developed by Sphera Solutions GmbH.

PCR Part A

PCR – Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Re-port according to EN 15804+A2:2019, Version 1.0, Institut Bauen und Umwelt e.V., www.ibu-epd.com.

PCR Part B

PCR – Part B: Requirements on the EPD for Automatic doors, automatic gates, and revolving door systems, 08/2021, Institut Bauen und Umwelt e.V., www.ibu-epd.com

REACH Regulation

REACH Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals.

ROHS3 Directive

Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment



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