ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	DORMA Deutschland GmbH
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-DOR-20160053-IBA1-EN
Issue date	29.04.2016
Valid to	28.04.2021

Modular Automatic Drive System for Sliding Doors - ES 200 product family

DORMA

Institut Bauen und Umwelt e.V.

www.bau-umwelt.com / https://epd-online.com

1. General Information

DORMA

Modular Automatic Drive System for Sliding Doors - ES 200 product family

Programme holder
IBU - Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Owner of the Declaration
DORMA Deutschland GmbH
Dorma Platz 1
58256 Ennepetal
Germany

Declaration number
EPD-DOR-20160053-IBA1-EN

Declared product / Declared unit
The declared unit is one modular automatic drive system for sliding doors comprising:

- the average sales volume of the ES 200 Standard, ES 200-2D, ES 200 EASY and ES 200 EASYplus, as well as
- the respective packaging materials.

This Declaration is based on the Product Category Rules:
Drive systems for automatic doors and gates, 07/2014
(PCR tested and approved by the SVR)

Scope:
This EPD refers to the entire life cycle of an average ES 200 drive system.
The various technical characteristics are depicted in section 2.3.
The production location is the DORMA production site in Ennepetal, Germany.
Product components are also procured from the DORMA location in Bonn. The material and energy flows were taken into consideration accordingly.
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.

Issue date
29.04.2016

Valid to
28.04.2021

Verification

The CEN Norm /EN 15804/ serves as the core PCR
Independent verification of the declaration according to /ISO 14025/
☐ internally ☒ externally

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

Dr. Burkhart Lehmann
(Managing Director IBU)

Dr.-Ing. Wolfram Trinius
(Independent verifier appointed by SVR)

2. Product

2.1 Product description

The innovative automatic drive system ES 200 for sliding doors is a solution for any fields of application and scope of operation. The ES 200 allows DORMA to supply a drive system that covers all applications due to its modular construction with a low number of components. The modular and flexible drive system is available in the following variants:

- ES 200 Standard
- ES 200 2D
- ES 200 EASY
- ES 200 EASYplus.

The product family of the modular automatic ES 200 drive system covers all above mentioned drive systems. Average values (material and energy flows) are based on the volumes of ES 200 variants sold during the reference period.

2.2 Application

The automatic ES 200 drive system is used as a drive for automating sliding door systems as well as escape and rescue routes:

Door parameters	ES 200 Stand-ard	ES 200 2D	ES 200 Easy	ES 200 EASY plus
Use in escape and rescue routes	-		-	-
Single-panel sliding door: - Opening width (clear width) [mm] - Door panel weight (max.) [kg]	700 – 3,000 1 x 200	900 – 1,800 1 x 150	700 – 3,000 1 x 120	700 – 3,000 1 x 200
Double-panel sliding door - Opening width (clear width) [mm] - Door panel weight (max.) [kg]	800 – 3,000 2 x 160	1,000 – 3,000 2 x 130	800 – 3,000 2 x 100	800 – 3,000 2 x 120

2.3 Technical Data

The following technical data is of relevance for the LCA:

Technical data	ES 200 Stan-dard	ES 200 2D	ES 200 EASY	ES 200 EASY plus
Height	100/ 150 mm			
Overall depth	180 mm			
Opening and closing force	Max. 150 N			
Opening speed (incremental adjustment) [cm/s]	10 - 70	10 - 70	10 - 50	10 - 55
Closing speed (incremental adjustment) [cm/s]	10 - 50	10 - 50	10 - 40	10 - 50
Hold-open time [sec.]	0.0 - 180	0.5 - 30	0.5 - 30	0.0 - 60
Supply voltage / Frequency	230 V / 50/60 Hz			
Wattage [W]	250	180	180	250
Protection class	IP 20			
Tested to low-voltage guidelines	•	•	•	•

2.4 Placing on the market / Application rules

The following standards are applicable for the placing on the market of the ES 200 product family:

- /EN 16005/
- /DIN 18650-1/ -2/
- /EN ISO 13849-1/
- /EN 60335-1/
- /EN 60335-2-103/
- /IEC 60335-2-103/

AutSchR 1997 (German guidelines for automatic sliding doors in escape routes) also applies for DORMA ST 200-2D only.
TÜV-Nord certificates are available for the respective products tested.

2.5 Delivery status

One automatic ES 200 drive system (averaged by sales volume) offers the following delivery status:

Components	Absolute	Percentage
Average ES 200	30.95 kg	86%
Average Packaging	5.17 kg	14%
TOTAL	**36.12 kg**	**100.0%**

2.6 Base materials / Ancillary materials

The ES 200 product family comprises the following components:

Components	Percentage
Aluminium elements	50%
Steel elements	23%
Electronic elements	23%
Plastic elements	4%
TOTAL	**100%**

2.7 Manufacture

The drive units and requisite circuit boards of the ES 200 product family are manufactured at DORMA. The certified Quality Management system in accordance with /DIN EN ISO 9001/ safeguards the high quality standard of DORMA products. It guarantees continuous improvement of the overall processes and product quality at the DORMA locations.

2.8 Environment and health during manufacturing

The Environment Management system at DORMA Ennepetal is certified according to /ISO 14001/. The industrial safety is certified to /OHSAS 18001/ and the Energy Management System to /ISO 50001/.

2.9 Product processing/Installation

DORMA deploys specially-trained assembly teams to install the product systems.

2.10 Packaging

The declared unit includes the following packaging materials and their percentages by mass:

Component	Percentage
Paper and cardboard	89 %
Wood	10 %
LDPE foil	1 %
TOTAL	**100 %**

More information on the possible re-use of packaging is provided in section 2.16.

2.11 Condition of use

No auxiliaries or consumables are incurred during maintenance, and use of the automatic drive system ES 200. Regular maintenance is advised to ensure the life expectancy of 10 years. For repairs or renewals, suitable spare parts are available. The energy supply for the analysed drive units has been calculated for the reference service life of 10 years.

2.12 Environment and health during use

There are no interactions between products, the environment and health.

2.13 Reference service life

The reference service life amounts to 10 years. This

complies with 1,000,000 closing cycles according to /EN 16005/.

2.14 Extraordinary effects

Fire
Not relevant!

Water
No hazardous substances are emitted into the environment on contact with water.

Mechanical destruction
The product has to be disposed properly.

2.15 Re-use phase
With reference to the material composition of the product in accordance with section 2.6, the following possibilities are available:

Material recycling
The materials suitable for material recycling primarily comprise the metallurgical materials processes in the product.

Energy recovery
The materials suitable for energy recovery primarily comprise the plastics contained in the product.

Landfilling
The entire product can be landfilled in the absence of waste recycling technologies.

2.16 Disposal
Scrap incurred during the production phase
The scrap incurred during the production phase is directed to material recycling. Scrap is collected separately by material type and disposed of. Waste codes in accordance with the /European Waste Catalogue (EWC) 2001/118/EC/:

- /EWC 12 01 01/ Ferrous metal filings and turnings

Packaging
The packaging components incurred during installation in the building are directed to an energy recovery process.

- /EWC 15 01 01/ Paper and cardboard packaging
- /EWC 15 01 02/ Plastic packaging
- /EWC 15 01 03/ Wooden packaging

End of Life
All materials are directed to an energy recovery or metallurgical recycling process.

- /EWC 16 02 14/ Used devices with the exception of those included in 16 02 09 to 16 02 13
- /EWC 16 02 16/ Components removed from used devices with the exception of those included in 16 02 15
- /EWC 16 06 01/ Lead batteries
- /EWC 17 02 03/ Plastic
- /EWC 17 04 02/ Aluminium
- /EWC 17 04 05/ Iron and steel
- /EWC 17 04 11/ Cables with the exception of those included in 17 04 10

Disposal of the drive unit in Europe is subject to the /WEEE Guideline 2002/96/EC/.

2.17 Further information
Contact data for more detailed information:
Please refer to the last page of this Declaration.

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is the average for one (1) modular automatic drive system for sliding doors as sales averages of the

- ES 200 Standard
- ES 200-2D
- ES 200 EASY
- ES 200 EASYplus

including the respective packaging materials.

Name	Value	Unit
Declared unit	1	pce.
Product weight	36.12	kg
Conversion factor to 1 kg	0.277	-

3.2 System boundary

Type of EPD: cradle to grave (with options)
The following modules are considered in accordance with /EN 15804/:

Modules A1-3, A4, A5

The product stage commences with consideration of the material and energy flows required for manufacturing the product, including all of the associated upstream chains and requisite transport associated with procurement. Furthermore the whole production phase at the production site Ennepetal was mapped, including the treatment of production waste towards achieving the End-of-Waste status (EoW). Distribution transports and the installation into the building were considered as well.

Module B3

This module covers the replacement of expendable parts over the entire operating life of 10 years.

Module B6

This module includes the energy consumption for operating the declared drive units including the stand-by modus over the entire operating life time of 10 years.

Modules C2-3

These modules include the environmental impact associated with waste treatment until reaching the End-of-Waste status (EoW) including the associated transport at the end of the product's life circle.

Module D

Evidence of credits incurred by waste treatment as a result of energetic (MVA route) or material recycling (recycling route) of packaging (A5), spare parts (B3) and the product at the End-of-Life (C3).

3.3 Estimates and assumptions

No estimates or assumptions were made which would be of relevance for interpreting the Life Cycle Assessment results.

3.4 Cut-off criteria

All of the relevant modules to /EN 15804/ were taken into consideration. All of the data from the operational data survey is taken into consideration. Accordingly, material flows have also been analysed with a mass percentage of less than one per cent. The total mass percentages not taken into consideration therefore remains significantly less than 1% of the overall mass utilisation. It can be assumed that the total of all neglected processes does not exceed 5% in the impact categories.

3.5 Background data

The software system /GaBi/ in the actual version 7 was used for modelling the life cycle. All of the background data records of relevance for manufacturing and disposal were taken from various /GaBi/ data bases as well as the /Ecoinvent/ data base (version 2.2). All data records used are documented online.
German data records were used for Modules A1-3 and European data records were used for distribution transport (A4), use (B Modules) and disposal scenarios (C Modules), wherever available.
The background data records from the /GaBi/ data bases used for the analysis pertain to the reference year 2013. Some of the /Ecoinvent/ data records used are more than 10 years old but are still regarded as the most suitable data for analysis in accordance with /CEN/TR 15941/. The /Ecoinvent/ data records can be classified as conservative on account of empirical values available.
The secondary and recycling material shares can only be considered using generic data records. An individual adjustment of these secondary shares is not possible with the analysis software /GaBi/ used.

3.6 Data quality

The data on the products under review was recorded using analyses of internal production and environmental data, LCA-relevant data within the supplier chain and analyses of relevant data for the provision of energy. The data surveyed have been examined for plausibility and consistency. Good data representativeness can be assumed.
The secondary and recycling rates are considered by the generic data sets information.

3.7 Period under review

The life cycle data was recorded for the period 1 January 2015 to 31 December 2015.

3.8 Allocation

The material flows were compiled on a production unit basis from the DORMA ERP system. All of the energy flows considered within this context were measured on site.
The credits for the reconverted product were attributed to Module D. The /GaBi/ data items for the material recycling do not indicate separate results for modules C3 and D. Owing to the credit overhang, the results were attributed to Module D.
Production waste with a market value was treated with the economic allocation as co-product in the data model.

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

4. LCA: Scenarios and additional technical information

Transport to site (A4)

Name	Value	Unit
Means of transport Truck, Euro 3	17.3 t	useful load
Transport distance	340	km
Capacity utilisation (including empty runs)	85	%

All of the distribution countries were recorded disproportionately in establishing the transport distance.

Construction installation process (A5)

Name	Value	Unit
Output substances following waste treatment on site Plastic protective foil	0.02	kg
Output substances following waste treatment on site Cardboard and paper	4.65	kg
Output substances following waste treatment on site Wood	0.50	kg
Disposal transport Means of transport Truck, Euro 3	17.3 t	useful load
Disposal transport Transport distance	50	km
Disposal transport Capacity utilisation (including empty runs)	85	%

Repairs (B3)

Name	Value	Unit
Material loss	7.57	kg

Repair cycle as per "Manufacturer guidelines on wear parts" provided by DORMA, indicated for a total operating period of 10 years.

Reference service life

Name	Value	Unit
Reference service life	10	a

Operational energy use (B6)

Name	Value	Unit
Equipment output	180 - 250	kW
Weighted energy consumption	1,668.50	kWh

Electricity consumption refers to the reference service life of 10 years.

End of Life (C1-C4)

Name	Value	Unit
For recycling	87	%
For energy recovery	13	%

The processes at the End-of-Life stage are modelled using data records which represent the European average.

Re-use, recovery and recycling potential (D)

Module D comprises credits for the material recycling of metals of the modules B3 and C3 as well as credits for the energetic recycling of plastics of modules B3 and C3 and the packaging materials of module A5.

5. LCA: Results

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	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	X	MND	MND	X	MND	MND	X	X	MND	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: Modular Automatic Drive System for Sliding Doors – ES 200 product family

Parameter	Unit	A1-A3	A4	A5	B3	B6	C2	C3	D
GWP	[kg CO_2-Eq.]	2.24E+2	5.80E-1	7.13E+0	4.34E+1	7.81E+2	1.89E-1	1.47E+1	-1.54E+2
ODP	[kg CFC11-Eq.]	2.47E-6	2.37E-12	3.43E-11	3.64E-7	5.82E-7	7.73E-13	1.04E-7	-3.93E-6
AP	[kg SO_2-Eq.]	1.37E+0	3.73E-3	1.52E-3	5.75E-1	3.93E+0	1.20E-3	1.82E-2	-7.85E-1
EP	[kg $(PO_4)^{3-}$-Eq.]	1.09E-1	9.57E-4	2.67E-4	1.88E-2	2.14E-1	3.07E-4	1.66E-3	-4.29E-2
POCP	[kg ethene-Eq.]	9.12E-2	-1.55E-3	1.10E-4	2.65E-2	2.29E-1	-4.93E-4	1.59E-3	-5.01E-2
ADPE	[kg Sb-Eq.]	1.19E-2	2.26E-8	1.20E-7	5.88E-3	1.24E-4	7.35E-9	1.18E-5	-1.73E-4
ADPF	[MJ]	2.54E+3	7.96E+0	1.88E+0	4.42E+2	8.71E+3	2.59E+0	1.20E+2	-1.70E+3

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

RESULTS OF THE LCA - RESOURCE USE: Modular Automatic Drive System for Sliding Doors – ES 200 product family

Parameter	Unit	A1-A3	A4	A5	B3	B6	C2	C3	D
PERE	[MJ]	6.68E+2	4.46E-1	2.12E-1	3.67E+1	2.93E+3	1.45E-1	4.90E+0	-6.98E+2
PERM	[MJ]	8.71E+1	4.22E-13	6.97E-12	1.75E+0	8.22E-8	1.37E-13	1.78E-5	2.87E-7
PERT	[MJ]	7.56E+2	4.46E-1	2.12E-1	3.84E+1	2.93E+3	1.45E-1	4.90E+0	-6.98E+2
PENRE	[MJ]	3.07E+3	7.99E+0	2.22E+0	4.91E+2	1.39E+4	2.60E+0	1.30E+2	-1.96E+3
PENRM	[MJ]	4.52E+1	0.00E+0	0.00E+0	2.18E-2	0.00E+0	0.00E+0	7.41E-10	1.77E-11
PENRT	[MJ]	3.11E+3	7.99E+0	2.22E+0	4.91E+2	1.39E+4	2.60E+0	1.30E+2	-1.96E+3
SM	[kg]	5.15E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	[MJ]	7.88E-2	5.30E-5	7.94E-5	3.62E-3	1.84E-1	1.73E-5	2.13E-3	5.86E-2
NRSF	[MJ]	6.88E-1	5.55E-4	3.69E-4	0.00E+0	1.92E+0	1.81E-4	1.53E-2	7.14E-1
FW	[m^3]	1.32E+3	3.58E-2	1.97E-1	4.55E+1	2.64E+3	1.16E-2	6.30E+0	-1.78E+3

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: Modular Automatic Drive System for Sliding Doors – ES 200 product family

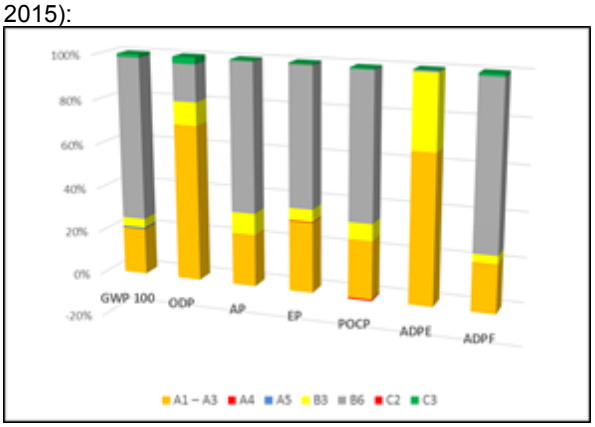
Parameter	Unit	A1-A3	A4	A5	B3	B6	C2	C3	D
HWD	[kg]	7.75E-2	0.00E+0	0.00E+0	3.20E-2	0.00E+0	0.00E+0	0.00E+0	6.94E-2
NHWD	[kg]	7.19E+2	3.01E-2	4.43E-1	2.44E+2	3.23E+3	9.79E-3	1.17E+1	-2.43E+2
RWD	[kg]	1.84E-1	1.09E-5	1.35E-4	1.30E-2	2.09E+0	3.55E-6	4.28E-3	-1.06E-1
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	3.11E+0	0.00E+0	0.00E+0	6.09E+0	0.00E+0	0.00E+0	2.56E+1	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	4.91E+0	1.48E+0	0.00E+0	0.00E+0	3.83E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	9.31E+0	2.79E+0	0.00E+0	0.00E+0	1.17E+1	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	2.19E+1	7.25E+0	0.00E+0	0.00E+0	2.87E+1	0.00E+0

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

6. LCA: Interpretation

ENVIRONMENTAL IMPACT

An evaluation of the LCA results enables the following interpretation of the CML results (CML version: April 2015):



The evaluation is dominated by the energy demand of the automatic drive units in module B6. This demand was considered with an EU-27 data set for the period of 10 years.

Especially the production of raw materials in module A1-3 dominates the Abiotic Depletion Potential of non-Fossil Resources (**ADPE**) and the Ozone Depletion Potential (**ODP**) due to the metals used (mainly aluminium). The result of the **ODP** is also negatively influenced by the electronic components in the product system (amongst others gear motor, power supply unit and magnets).

The production of raw materials, processing and disposal of materials for the expendable parts in module B3 is noticeable along all CML-effect indicators. Especially the Abiotic Depletion Potential of non-Fossil Resources (**ADPE**) is affected by this module as apart from module A1-3 the production of raw materials of metallurgic basic material is considered here.

Transports (modules A4 and C2) and the installation into the building (module A5) are not of importance for any of the CML indicators.

RESOURCE USE

In the following the use of resources is interpreted module by module.

Primary energy

Module B6 dominates the whole life cycle with 79 %, as the energy demand of the drive unit over 10 years is displayed here. Module A1-3 with about 18 % is far behind module B6, as well as module B3 with 2 %. So the basic materials used and their pre-processes play an important but not significant role in the whole life cycle. The disposal phase in module C3 has a rate of 1 % of the whole primary energy demand.

Fresh water

The water consumption in module A1-3 takes 33 % over the entire life cycle and has its origin in 92 % of the pre-processes in the aluminium used for the analysed product system. The electronic components used make up 4-5 % and electricity derived out of hydro power in the production is responsible for 1 %. Module B6, that depicts the energy demand of the average drive unit system, has the highest water consumption with a share of 66 % over the life cycle. This share highly depends on the power mix used in practice. The modelling was done by using the EU-27 power mix.

WASTE CATEGORIES

Disposed non-hazardous waste dominates the waste categories. Module B6 with the upstreams of the power-mix used is of main significance. Apart from this module the waste derives from the upstreams of the aluminium and steel used in modules A1 and B3. Radioactive waste mainly derives from module B6 and in minor terms from modules A1 and B3.

Hazardous waste derives mainly from module A1 with the pre-processes (upstreams) of the metallurgic basic materials (primary aluminium).

7. Requisite evidence

The endurance test for compliance with the number of 1,000,000 closing cycles is confirmed by the certificate from TÜV Nord.

8. References

Institut Bauen und Umwelt e.V., Königswinter (ed.): Creation of Environmental Product Declarations (EPD); General principles for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013-04.

PCR, Part A: Institut Bauen und Umwelt e.V., Königswinter (pub.): Product Category Rules for Building 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 Background Report, version 1.2, 2012-09.

PCR, Part B: Institut Bauen und Umwelt e.V., Königswinter (pub.): PCR instructions for building-related products and services in the building product group of drive systems for automatic doors and gates, 2014-07.

AutSchR 1997: Directive governing automatic sliding doors in rescue routes, December 1997.

CEN/TR 15941: Sustainability of construction works – Environmental product declarations – Methodology for selection and use of generic data; German version

CEN/TR 15941:2010.

DIN 18650-1: Automatic Door Systems – Part 1: Product requirements and test methods, 2010.

DIN 18650-2: Automatic Door Systems – Part 2: Safety at powered pedestrian doors, 2010.

EN 15804: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products; German version EN 15804:2012+A1:2013, 2014-07.

EN 16005: Power-operated pedestrian doorsets – Safety in use – Requirements and test methods; German version EN 16005:2012.

EN 60335-1: Safety of household and similar electrical appliances. - Part 1: General requirements; German version EN 60335-1:2012.

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); German version EN 60335-2-103:2003/prA1:2005.

Ecoinvent: Ecoinvent Centre
www.ecoinvent.org

European Waste Catalogue (EWC) 2001/118/EC: Commission decision dated 16 January 2001 on amending Decision 2000/532/EC on a waste directory.

GaBi: thinkstep AG
www.gabi-software.com/databases/

ISO 9001: Quality management systems - Requirements (ISO 9001:2008); trilingual version EN ISO 9001:2008**.**

ISO 13849-1: Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design; German version EN ISO 13849-1:2008.

ISO 14001: Environmental management systems – Requirements with guidance for use (ISO 14001:2004 + Cor. 1:2009); German and English versions EN ISO 14001:2004 + AC:2009, 2009.

ISO 14025: Environmental designations and declarations – Type III Environmental Declarations – Basic principles and processes (ISO 14025:2006); German and English versions DIN EN ISO 14025:2011.

ISO 14040: Environmental management - Life cycle assessment - Principles and framework (ISO 14040:2006); German and English version EN ISO 14040:2006.

ISO 14044: Environment Management – Life Cycle Assessment – Requirements and Instructions (ISO 14044:2006); German and English versions EN ISO 14044:2006.

ISO 50001: Energy management systems. Requirements with guidance for use; German version EN ISO 50001:2011.

OHSAS 18001: Occupational health and safety – Management systems – Requirements, 2007.

WEEE Guideline 2002/96/EC: Directive 2020/96/EC of the EUROPEAN PARLIAMENT AND COUNCIL dated 27 January 2003 on used electric and electronic equipment.

Institut Bauen und Umwelt
Institut Bauen und Umwelt e.V., Berlin(pub.): Generation of Environmental Product Declarations (EPDs);

General principles
for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013/04
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ISO 14025
DIN EN ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804
EN 15804:2012-04+A1 2013: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

Publisher
Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Tel +49 (0)30 3087748- 0
Fax +49 (0)30 3087748- 29
Mail info@bau-umwelt.com
Web **www.bau-umwelt.com**

Programme holder
Institut Bauen und Umwelt e.V.
Panoramastr 1
10178 Berlin
Germany

Tel +49 (0)30 - 3087748- 0
Fax +49 (0)30 – 3087748 - 29
Mail info@bau-umwelt.com
Web **www.bau-umwelt.com**

Author of the Life Cycle Assessment
brands & values GmbH
Vagtstr. 48/49
28203 Bremen
Germany

Tel +49 421 69 68 67 15
Fax +49 421 69 68 67 16
Mail info@brandsandvalues.com
Web **www.brandsandvalues.com**

Owner of the Declaration
DORMA Deutschland GmbH
DORMA Platz 1
58256 Ennepetal
Germany

Tel +49 (0)2333 793- 0
Fax +49 (0)2333 793 4950
Mail info@dorma.com
Web **www.dorma.de**