

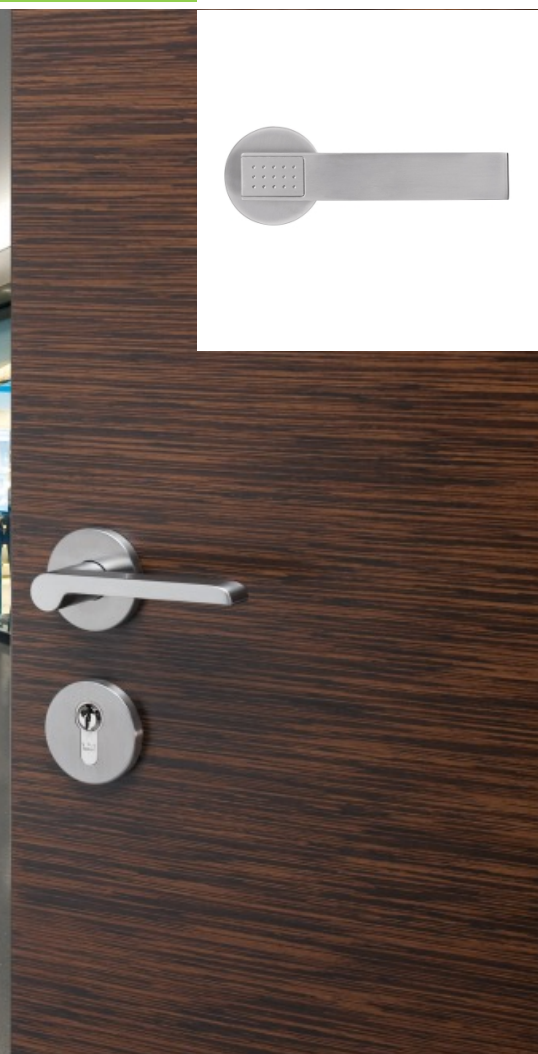
# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	<b>DORMA Beschlagtechnik GmbH</b>
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-DOR-2012421-IBC22-EN
Issue date	18.12.2012
Valid to	17.12.2017

## Door Handles aluminium – OGRO and CORE Series DORMA Beschlagtechnik GmbH

[www.bau-umwelt.com](http://www.bau-umwelt.com) / <https://epd-online.com>



## 1. General Information

### DORMA Beschlagtechnik GmbH

#### Programme holder

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

#### Declaration number

EPD-DOR-2012421-IBC22-EN

#### This Declaration is based on the Product Category Rules:

Locks and fittings , 07.2014  
(PCR tested and approved by the SVR)

#### Issue date

18.12.2012

#### Valid to

17.12.2017



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



Dr. Burkhard Lehmann  
(Managing Director IBU)

### Door Handles aluminium - OGRO and CORE Series

#### Owner of the Declaration

DORMA Beschlagtechnik GmbH  
Donnenberger Straße 2  
42553 Velbert

#### Declared product / Declared unit

This Declaration refers to an average fitting (arithmetical average) from the OGRO/ CORE Series made of aluminium:

OGRO/ CORE building fitting for full-leaf doors

- Door handle model 8100
- Door handle rosette model 6501
- Key rosette model 6612 with profile cylinder hole

OGRO/ CORE building fitting for full-leaf doors

- Door handle model 8350 V
  - Key rosette model 6621 with profile cylinder hole
- incl. packaging material and weighs on average 722.3 g (aluminium).

*\* the CORE Series isn't considered in the averaging the OGRO Series but both series are identical on the Hardware side.*

#### Scope:

Die Ökobilanz beruht auf Daten, die im Zeitraum von 01 bis 06-2012 am Produktionsstandort Velbert, Deutschland erhoben wurden. Der Inhaber der Deklaration haftet für die zugrundeliegenden Angaben und Nachweise. 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.

#### Verification

The CEN Norm /EN 15804/ serves as the core PCR

Independent verification of the declaration according to /ISO 14025/

internally  externally



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

## 2. Product

### 2.1 Product description

DORMA Beschlagtechnik GmbH manufactures door and window fittings made of aluminium for the OGRO/ CORE segment.

#### DORMA OGRO/ CORE product features:

##### Compatibility

The modular system permits flexible combinations of the individual components.

### DORMA OGRO/ CORE door handles in long-term tests

OGRO/ CORE aluminium door handles are subjected to long-term tests with up to 2,000,000 test cycles and confirmed by the MPA. They therefore far exceed the requisite 200,000 test cycles in accordance with DIN EN 1906 Class 4.

##### Bases

The bases enable reliable introduction of high forces to the door panel thereby relieving the fitting and lock.



### Slide bearing

The maintenance-free slide bearing safely absorbs tilting pressure and traction relieving the strain on the lock follower.

### Click & go assembly

Four click elements facilitate fast assembly of the door handle. The door handles are firmly fixed / rotatable.

### Retaining springs

Four retaining springs ensure that the door handles remain horizontal in everyday use. The fittings can be used on the left or right.

### Extended supporting cams

The extended supporting cams on the thread side of full-leaf rosettes and doorplates enable door thickness intervals of 15 mm to be covered using a screw/pin combination.

### Continuous screw connections

The slack-protected continuous (M5) screws create a stable connection between the rosette or doorplate pairs on full-leaf doors.

## 2.2 Application

DORMA OGRO/ CORE door handles are suitable for practically all applications:

- For use on doors subject to frequent use of force, e.g. football stadiums, military barracks, schools, public toilets
- For extremely high public traffic and maximum strains on the building
- For use in public buildings, e.g. hospitals or administrative buildings
- Versatile, barrier-free applications
- Use in glass doors
- Use in mechanically high-strength apartment entrance doors subject to DIN 18257
- Use in panic, escape, rescue route and fire protection doors
- Use in doors with electronic access control

## 2.3 Technical Data

The following test standards are of relevance for the product:

- DIN 17440: Steel and Steel Alloys
- DIN EN 179: Building hardware – Emergency exit devices operated by a lever handle or push pad, for use on escape routes
- DIN EN 1125: Building hardware – Panic exit devices operated by a horizontal bar, for use on escape routes – Requirements and test methods
- DIN EN 1634: Fire resistance of door and locking equipment
- DIN EN 1906: Requirements and test methods for door handles and knob furniture in the classification key
- DIN 18 082 Part 1: Fire protection closures for steel doors T 30-1
- DIN 18 095 Parts 1 + 2: Doors and smoke control doors
- DIN 18 255: Building hardware
- DIN 18 257: Protective fittings
- DIN 18 273: Lever handle units for fire doors and smoke control doors
- DIN 4102 Parts 5 + 18: Fire Performance of Building Materials and Components
- DIN 18040: Construction of accessible buildings

## 2.4 Placing on the market / Application rules

The following regulations are of relevance for the product:

- German Institut of Building Technology Building Rules List: DIN 18273: Lever handle units for fire doors
- Conformity with European standards CE DIN EN 179: Building hardware

## 2.5 Delivery status

One representative fitting including the packaging materials weighs:

- Aluminium = 722 g

## 2.6 Base materials / Ancillary materials

The following table lists the components of one fitting (excl. packaging materials) as mass percentages on delivery.

### Aluminium

Components	Percentage [M-%]
Aluminium	69%
Steel	25%
Plastic	4%
Stainless steel	2%
<b>TOTAL</b>	<b>100%</b>

## 2.7 Manufacture

### Aluminium

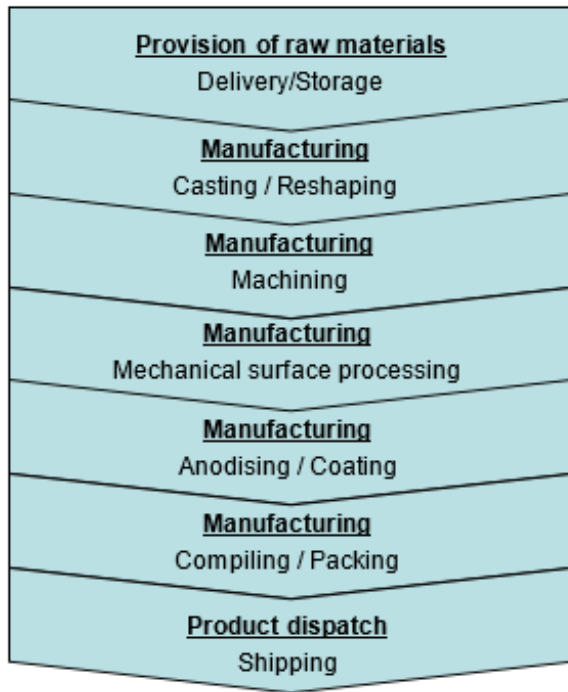
The aluminium door handles are manufactured as female parts in a die gravity casting process. Various mechanical machining processes are carried out for manufacturing the functional areas and the visible areas prepared for the next stage which involves grinding.

The doorplates and rosettes are manufactured from aluminium sheeting in a punching and reshaping process.

The surface of the aluminium handles, doorplates and rosettes is prepared for the subsequent anodising process in various grinding processes.

The anodising process attributes the surface its natural colour. Alternatively, the fitting components can be dyed to customer requirements during anodising or powder-coated in colour afterwards.

Anodising is followed by packing the aluminium handles in accordance with the customer requirements along with the doorplates/rosettes and accessories individually or in groups.



## 2.8 Environment and health during manufacturing

DORMA Beschlagtechnik GmbH is certified in accordance with DIN ISO 9001 / DIN EN ISO 14001, by the DQS in Germany, with international confirmation in the form of a certificate issued by Gesellschaft IQNet.

### Air

Waste air generated during production is cleaned in accordance with statutory specifications. Emissions are significantly lower than the limit values specified by the TA Luft.

### Noise

Sound protection analyses have established that all values communicated inside and outside the production facilities comply with statutory guidelines.

## 2.9 Product processing/Installation

The general rules of technology are maintained and permanently improved in the areas of health and safety and environment protection.

## 2.10 Packaging

To provide protection during transport, the fittings are packed in PE bags and packaged individually or in groups in modular corrugated board packaging.

## 2.11 Condition of use

No material impact relationships are known during use and can therefore be excluded.

## 2.12 Environment and health during use

There are no impact relationships between the product, the environment and health. The product does not contain any harmful substances. Accordingly, emissions can be excluded.

## 2.13 Reference service life

In accordance with DIN EN 1906, a long-term test with up to 2,000,000 test cycles was carried out with

DORMA OGRO/ CORE aluminium fittings and confirmed by the MPA.

## 2.14 Extraordinary effects

### Fire

In accordance with DIN 18273, DORMA OGRO/ CORE fittings made of aluminium are classified as follows:

- OGRO/ CORE building fittings in accordance with construction materials class B2 to DIN 4102-1 are regarded as being of "normal flammability".
- OGRO/ CORE fire protection fittings in accordance with construction materials class A to DIN 4102-1 are regarded as being "non-flammable". At temperatures in excess of 300 °C, small volumes of gas can be released.

### Water

No contamination of water or soil. Production-related waste water is treated in-house.

### Mechanical destruction

There are no impacts on the environment in the event of unforeseen mechanical destruction.

## 2.15 Re-use phase

The product system displays the following possibilities of reuse:

### Reuse

It is possible to replace individual components as required.

### Material recycling

The fitting components can be redirected to the raw materials cycle by means of separate recycling.

### Energy recovery

The plastic components and packaging materials can be directed to the MVA route taking consideration of national guidelines.

### Landfilling

As the product does not contain any substances which are hazardous to the environment or human health, the entire system can be landfilled without reservation where no other waste recovery technologies are in place.

## 2.16 Disposal Packaging

The packaging materials must be disposed of in accordance with the national packaging directive:

- EWC 15 01 01 Paper and cardboard packaging
- EWC 15 01 02 Plastic packaging

### Disposal phase

All materials are directed to energy or metallurgical recovery in line with any waste technology available:

- EWC 17 02 03 Plastic
- EWC 17 04 02 Aluminium
- EWC 17 04 05 Iron and steel

## 2.17 Further information

More information on technical data and other product variants is available from the following contacts:



### 3. LCA: Calculation rules

#### 3.1 Declared Unit

The declared unit is 1 (one) decorative fitting of the OGRO/ CORE aluminium variant with average weights (incl. packaging materials) of 722 g (aluminium). The Declaration is based on an average value obtained as an arithmetical average of the following building fittings:

OGRO/ CORE building fitting for full-leaf doors

- Door handle model 8100
- Door handle rosette model 6501
- Key rosette model 6612 with profile cylinder hole

OGRO/ CORE building fitting for full-leaf doors

- Door handle model 8350 V
- Key rosette model 6621 with profile cylinder hole

The LCA results (section 5) can therefore be regarded as representative for full-leaf and profile doors. Deviations from this average are  $\pm 0.2\%$  in the case of aluminium.

#### 3.2 System boundary

Type of EPD: cradle to gate with options  
In accordance with EN 15804, the following modules are taken into consideration:

##### Product stage: A1 – A3

The extraction and preparation of raw materials including all of the corresponding upstream chains as well as the provision of electricity, steam and heat from primary energy resources including the extraction, refinement and transport thereof, and the requisite procurement transport to the plant gate and the manufacturing of packaging are considered in this module.

##### Construction stage: A4 – A5

This module comprises the average distribution routes as well as energy recovery associated with the packaging materials.

##### Disposal stage: C2 – C3

This module takes consideration of transport to the recycling plant as well as the expenses incurred by collection, preparation and recycling.

##### Credits: D

The value streams incurred for a downstream product system based on material recycling processes as well as energy recovery are indicated in this module. The Life Cycle Assessment was drawn up for Germany as a reference area. This means that apart from the production processes under these marginal conditions, the pre-stages also of relevance for Germany such as provision of electricity or energy carriers were used.

#### 3.3 Estimates and assumptions

The most realistic data records were selected. The distribution countries were recorded proportionately (A4). The collective loss of packaging materials (A5) and the product system at the End of Life (C3) is considered as 5%. The distance from the

demolition site to the disposal site (C2) is estimated at 75 km.

#### 3.4 Cut-off criteria

All of the data from the operational data survey and all emission measurements available for the period referred to in section 3.7 were taken into consideration. Furthermore, the data pertaining to transport expenses was recorded and modelled for all inputs considered. The infrastructure (especially machines and production plants) used in the manufacturing processes were not taken into consideration in the analysis. Nor were the transport expenses incurred for packaging taken into consideration. Furthermore, varnishes were not taken into consideration on account of their low mass percentage of  $< 1\%$ .

It can be assumed that the total of all neglected percentage shares does not exceed 5% in the impact categories and is therefore of subordinate significance.

#### 3.5 Background data

The current version 5 of the GaBi software system for life cycle engineering was used for modelling the life cycle. All of the background data used was taken from the current versions of various GaBi data bases and the ecoinvent data base (version 2.2). The data items contained in the data bases are documented online. The Life Cycle Assessment was drawn up for Germany as a reference area. This means that apart from the production processes under these marginal conditions, the pre-stages also of relevance for Germany such as provision of electricity or energy carriers were used. The secondary and recycling percentages can only be taken into consideration via the generic data records.

#### 3.6 Data quality

Data was collated on the basis of evaluations of internal production and environmental data, recording LCA-relevant data within the supplier chain and by measuring the relevant data for the provision of energy. The data collated from operating data records and measurements has been examined for plausibility. Very good data representativity can be assumed after detailed examination.

The data records used for the LCA are generally no more than 10 years old.

#### 3.7 Period under review

The data on which the LCA is based was collated representatively for the period from January to June 2012.

#### 3.8 Allocation

There are no co-products in place. An individual product is manufactured within the framework of the production process.

#### 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 the site (A4)

Litres of fuel GLO: Truck PE  
 Transport distance 949.89 km  
 Use of capacity (including empty runs) 85%

*All of the distribution countries were recorded proportionately when establishing the transport distance. Transport to the site is depicted with the corresponding fuel data records.*

### Installation in the building (A5)

Output materials incurred by waste treatment on site:  
 Plus Aluminium: Packaging materials 87.2 g  
*Details as waste potential: A collective loss of 5% is considered in the LCA results. Transport is allocated to Module C2.*

### Reference service life

Reference service life 80 years

### End of Life (C1-C4)

#### OGRO/ CORE aluminium:

For recycling 608.9 g  
 For energy recovery 26.4 g

*Details as waste potential: A collective loss of 5% is considered in the LCA results.*

### Disposal transport (C2)

Means of transport: Truck, 17.3 t useful load  
 Euro 3, freight  
 Transport distance: 75 km  
 Use of capacity (including empty runs) 50%

### Reuse, recovery and recycling potential (D)

Metal is directed to materials recycling while plastic and packaging materials are directed to energy recovery. The ensuing credits are allocated to Module D.

## 5. LCA: Results

In Table 1 "Description of the system boundary", all declared modules shall be indicated with an "X"; all modules that are not declared shall be indicated with "MND". In the following tables 2, 3 and 4, columns may be deleted for modules that are not declared. Indicator values should be declared with three valid digits (eventually exponential form (e.g. 1,23E-5 = 0,0000123). A uniform format should be used for all values of one indicator. If several modules are not declared and therefore have been deleted from the table, the abbreviations for the indicators can be replaced by the complete names, while the readability and clear arrangement should be preserved; the legends can then be deleted.

If no reference service life is declared (see chapter 2.13 "Reference Service Life"), the LCA results of the modules B1-B2 and B6-B7 must refer to a period of one year. This must be indicated as an explanatory text in Chapter 5, "LCA: Results". Also in this case, the calculation formula for the total life cycle results is to be specified.

### 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	MND	MND	MND	MND	MND	MND	X	X	MND	X

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 OGRO/ CORE aluminium door handle, accessories

Parameter	Unit	A1-A3	A4	A5	C2	C3	D
Global warming potential	[kg CO <sub>2</sub> -Eq.]	2.88E+0	4.10E-2	7.71E-2	4.10E-3	2.21E-1	-4.05E+0
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	1.63E-7	1.52E-11	5.17E-11	1.25E-12	9.37E-9	-3.91E-7
Acidification potential of land and water	[kg SO <sub>2</sub> -Eq.]	9.57E-3	2.64E-4	-3.28E-5	2.66E-5	4.58E-4	-1.95E-2
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3</sup> -Eq.]	8.22E-4	6.35E-5	-3.73E-6	6.41E-6	3.94E-5	-8.64E-4
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	9.00E-4	-1.07E-4	-8.66E-6	-1.08E-5	3.35E-5	-1.18E-3
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	3.63E-5	1.62E-9	-1.80E-9	1.62E-10	8.13E-8	-7.07E-6
Abiotic depletion potential for fossil resources	[MJ]	3.82E+1	5.66E-1	-1.22E+0	5.67E-2	2.26E+0	-3.87E+1

### RESULTS OF THE LCA - RESOURCE USE: 1 OGRO/ CORE aluminium door handle, accessories

Parameter	Unit	A1-A3	A4	A5	C2	C3	D
Renewable primary energy as energy carrier	[MJ]	2.44E+1	2.22E-2	2.47E-3	2.22E-3	1.11E-1	-1.59E+1
Renewable primary energy resources as material utilization	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total use of renewable primary energy resources	[MJ]	2.44E+1	2.22E-2	2.47E-3	2.22E-3	1.11E-1	-1.59E+1
Non-renewable primary energy as energy carrier	[MJ]	4.51E+1	5.68E-1	-1.21E+0	5.69E-2	2.79E+0	-5.31E+1
Non-renewable primary energy as material utilization	[MJ]	5.23E-6	0.00E+0	0.00E+0	0.00E+0	8.93E-11	-2.66E-9
Total use of non-renewable primary energy resources	[MJ]	5.23E-6	0.00E+0	0.00E+0	0.00E+0	8.93E-11	-2.66E-9
Use of secondary material	[kg]	3.42E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of non-renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of net fresh water	[m <sup>3</sup> ]	-	-	-	-	-	-

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

#### 1 OGRO/ CORE aluminium door handle, accessories

Parameter	Unit	A1-A3	A4	A5	C2	C3	D
Hazardous waste disposed	[kg]	-	-	-	-	-	-
Non-hazardous waste disposed	[kg]	-	-	-	-	-	-
Radioactive waste disposed	[kg]	-	-	-	-	-	-
Components for re-use	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.09E-1	0.00E+0
Materials for energy recovery	[kg]	0.00E+0	0.00E+0	8.71E-2	0.00E+0	2.64E-2	0.00E+0
Exported electrical energy	[MJ]	0.00E+0	0.00E+0	2.35E-1	0.00E+0	4.32E-2	0.00E+0
Exported thermal energy	[MJ]	0.00E+0	0.00E+0	6.54E-1	0.00E+0	1.13E-1	0.00E+0

## 6. LCA: Interpretation

The analysis was evaluated using relative values for the dominance analysis and the minimum threshold value specified as 10%.

### OGRO/ CORE aluminium

In all of the impact categories to CML 2001 Nov. 2010, the extraction of raw materials is considered to be the

most dominant phase in the entire life cycle of the product system. Analogue to the Life Cycle Inventory Analysis, this can be attributed to the high percentage of metallurgical components (69 percentage mass accounted for by aluminium and 27% by steel) as well as the extraction of raw materials and upstream production associated with them.

Accounting for a mass percentage of 4%, the plastic components and transport processes are of subordinate significance in terms of their environmental impact. The same applies to the use of green electricity during manufacturing.

The aluminium and steel components and/or their upstream chains dominate primary energy requirements.

Aluminium is the main factor for the environmental indicators. The difference in aluminium mass and the product variants depicted as averages is  $\pm 1\%$ . The ensuing influence on the LCA indicators does not tend to be of significance.

#### Comments

At its last meeting on 4 October 2012, the Expert Committee (SVA) at IBU clearly defined the rules for calculating the declaration of waste. The data from the data bases on which the background data used is based must therefore be revised. Accordingly, this Environmental Product Declaration complies with the interim solution approved by the SVA and is generated without a waste declaration.

Likewise, the background data used does not indicate the use of fresh water resources. The Declaration is therefore issued without any values pertaining to fresh water.

## 7. Requisite evidence

This Environmental Product Declaration does not require any evidence in relation to the material composition in the product and its area of application.

## 8. References

**Institute Construction and Environment e.V.**, Berlin (pub.):

**Product Category Rules for Construction Products Part A:** Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. 2011-07

**Product Category Rules for Construction Products Part B:** Requirements on the EPD for locks and fittings. 2012-07

[www.bau-umwelt.de](http://www.bau-umwelt.de)

**2001/118/EC** European Waste Catalogue (EWC) – Decision by the Commission on 16 January 2001 amending the 2000/532/EC decision on a waste index

**CEN/TR 15941:2010-03:** Sustainability of construction works – Environmental product declarations – Methodology for selection and use of generic data; German version CEN/TR 15941:2010

**DIN EN ISO 9001:2008-12:** Quality management systems – Requirements (ISO 9001:2008); Tri-lingual version EN ISO 9001:2008

**DIN EN ISO 14001:2009-11:** Environmental management systems - Requirements with guidance for use (ISO 14001:2004 + Cor. 1:2009); German and English version EN ISO 14001:2004 + AC:2009

**DIN EN ISO 14044:2006-10:** Environmental management – Life cycle assessment – Requirements and guidelines (ISO 14044:2006); German and English version EN ISO 14044:2006

**DIN 18257:2003-03:** Building hardware – Security plates – Definitions, measurements, requirements, marking

**DIN EN 1906:2012-12:** Building hardware – Lever handles and knob furniture – Requirements and test methods; German version EN 1906:2012

**DIN EN 179:2008-04:** Building hardware – Emergency exit devices operated by a lever handle or push pad, for use on escape routes – **Requirements and test methods; German version EN 179:2008**

**DIN EN 1125:2008-04:** Building hardware – Panic exit devices operated by a horizontal bar, for use on escape routes – Requirements and test methods; German version EN 1125:2008

**DIN EN 1634-1:2009-01:** Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware - Part 1: Fire resistance tests for doors, shutters and openable windows; German version EN 1634-1:2008

**DIN EN 1634-2:2009-05:** Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware – Part 2: Fire resistance characterisation test for elements of building hardware; German version EN 1634-2:2008

**DIN EN 1906:2012-12:** Building hardware – Lever handles and knob furniture – Requirements and test methods; German version EN 1906:2012

**DIN 18082 Teil 1:** Feuerschutzabschlüsse Stahltüren T 30-1; Bauart A

**DIN 18095-1:1988-10:** Smoke control doors; concepts and requirements

**DIN 18095-2:1991-03:** Smoke control doors; type testing for durability and leakage

**DIN 18255:2002-05:** Building hardware - Door lever handles, backplates and escutcheons - Definitions, dimensions, requirements and marking

**DIN 18257:2003-03:** Building hardware - Security plates – Definitions, measurements, requirements, marking

**DIN 18273:1997-12:** Building hardware - Lever handle units for fire doors and smoke control doors - Concepts and definitions, dimensions, requirements and testing





**DIN 4102-5:1977-09:** Fire Behaviour of Building Materials and Building Components; Fire Barriers, Barriers in Lift Wells and Glazings Resistant against Fire; Definitions, Requirements and Tests

**DIN 4102-18:1991-03:** Fire behaviour of building materials and components; fire barriers, verification of automatic closure (continuous performance test)

**DIN 18040-1:2010-10:** Construction of accessible buildings – Design principles – Part 1: Publicly accessible buildings

**DIN 18040-2:2011-09:** Construction of accessible buildings - Design principles - Part 2: Dwellings

**DIN 18273:1997-1:** Building hardware - Lever handle units for fire doors and smoke control doors - Concepts and definitions, dimensions, requirements and testing

**Ecoinvent:** Data base for life cycle assessment (life cycle inventory analysis data), version 2.2 Swiss Centre for Life Cycle Inventories, St. Gallen

**GaBi 5:** Software and databasis for Life Cycle Engineering. LBP, University of Stuttgart and PE International, 2011.

**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  
[www.bau-umwelt.de](http://www.bau-umwelt.de)

**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

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