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-20140192-CBD1-EN
Issue date	28.10.2014
Valid to	27.10.2019

RTS 85, RTS 88, and BTS 84 Series Concealed Door Closers

DORMA

Institut Bauen und Umwelt e.V.

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

General Information

DORMA

Programme holder
IBU - Institut Bauen und Umwelt e.V.
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Germany

Declaration number
EPD-DOR-20140192-CBD1-EN

This Declaration is based on the Product Category Rules:
Locks and fittings , 07.2014
(PCR tested and approved by the independent expert committee)

Issue date
28.10.2014

Valid to
27.10.2019

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

Dr. Burkhart Lehmann
(Managing Director IBU)

RTS 85, RTS 88, and BTS 84 Series Door Closers

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

Declared product / Declared unit
The declaration represents one concealed door closer unit.

Scope:
The declaration and the background LCA represent DORMA's RTS 85, RTS 88, and BTS 84 Series concealed door closers. Raw materials and components are provided by suppliers and shipped to DORMA, where the closers are manufactured and assembled at DORMA facilities in Suzhou, China. The RTS and BTS differ in how they are mounted to the door (floor versus frame), but are otherwise identical products. 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 tester appointed by SVA)

Product

Product description
DORMA's RTS 85, RTS 88, and BTS 84 Series concealed door closers offer a solution for installations where door control must be provided without disturbing aesthetic appearance or compromising durability. They can be installed a number of different configurations, including in standard, narrow or wide door frames, as well as with left-hand or right-hand single- or double-action mounting. The closers are designed for a wide variety of doors and represent an excellent alternative to surface-mounted closers. A comprehensive selection of accessories ensures that they can be used successfully with a wide variety of door constructions and floor coverings. Product benefits include:

- *For the trade:* Just one body for all types of fixing. Low inventory and minimal stocking requirements thanks to unit packs for closer bodies and accessories. Reliability and a dependable design provide long lasting performance without the visual obtrusiveness of a surface mounted closer.
- *For the installer:* Easy installation allows installers to be more productive with their time, especially because the majority of the preparation can be done prior to the installation of the unit. No floor preparation is necessary in the case of frame-mounted closers. Additionally, the "zero" position for double action doors is easy to adjust and closers are available with a comprehensive range of accessories.
- *For the architect:* Provides an aesthetically pleasing solution, especially for toughened glass doors, and is ideal for shop fitting applications.
- *For the user:* Avoids cluttering of door appearance, and backcheck prevents door contact with the frame. Closing mechanism allows for smooth performance with adjustable speed and is adjustable to accommodate traffic and weather changes.

Application
The RTS 85, RTS 88, and BTS 84 Series offer an aesthetically pleasing solultion and are well-suited for use in moveable partitions and toughened glass doors, along with aluminum, wood, and hollow metal frames. The closers can be used for retrofit applications to replace surface-mounted closers. They are not intended for use in fire or smoke doors.

Technical Data
The concealed door closers employ a cam and roller mechanism, and are capable of controlling interior and exterior doors. They are non-handed, with a single closer for both single and double-acting doors. Users can adjust closing speed and optionally take advantage of mechanical hold-open points.

Certifications include /ISO 9001/.

Name	Value	Unit
Length	323	mm
Width	90	mm
Height	38	mm
Weight	4.4	kg
Test standards and methods	/EN 1154/	

Base materials / Ancillary materials

Name	Value	Unit
Iron	53	%
Steel	38	%
Oil	6	%
Aluminum	3	%

Reference service life
No use stage modules are reported; as such, declaration of the reference service life (RSL) is voluntary. The RSL is not reported for the RTS 85, RTS 88, or BTS 84 Series closers.

LCA: Calculation rules

Declared Unit
The declared unit of this analysis is one concealed door closer.

Declared unit

Name	Value	Unit
Declared unit (1 closer)	1	1 piece/product
Mass of system (without packaging)	4.4	kg
Conversion factor to 1 kg	0.23	-

System boundary
Type of EPD: cradle-to-gate - with options. The following modules were considered in the analysis:

Product stage:
- Raw material supply (A1)
- Inbound transport (A2)
- Manufacturing (A3)

Construction process stage:
- Distribution (A4)
- Installation (A5)

End-of-life stage:
- Disposal (C4)

Beyond system boundaries:
- Reuse, recovery, recycling potential (D)

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.

LCA: Scenarios and additional technical information

Additional information is provided for declared modules, including A4, A5, C4, and D. In order to represent DORMA's global distribution network, a sales-weighted average is used to model transport to the building site. The table for Module A4 shows both weighted average transportation distance (given regional concealed closer sales), which is used in the analysis, along with the variation in that distance. Additionally, estimated global average recycling rates are used to represent product disposal.

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel (truck)	31	l/100km
Transport distance	2400 - 22800	km
Average transport distance (SI)	15600	km
Capacity utilisation (including empty runs)	85	%

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site (packaging)	0.51	kg

End of life (C1-C4)

Name	Value	Unit
Recycling	3.9	kg
Landfilling	0.5	kg

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

Name	Value	Unit
Recycling rate, aluminum	60	%
Recycling rate, paper	90	%
Recycling rate, plastics	14	%
Recycling rate, steel and iron	88	%

LCA: Results

The table below summarizes which modules are declared (as indicated by an "X"), and which are not declared (as indicated with "MND"). Environmental performance results are shown for one (1) concealed door closer.

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 BOUNDARYS
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement[1)]	Refurbishment[1)]	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	MND	MND	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 closer (4.4kg)*

Parameter	Unit	A1 - A3	A4	A5	C4	D
Global warming potential	[kg CO_2-Eq.]	1.437E+1	1.060E+0	1.460E-1	7.200E-3	-3.540E+0
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	3.580E-8	4.210E-12	1.430E-13	9.790E-14	1.000E-7
Acidification potential of land and water	[kg SO_2-Eq.]	5.042E-2	2.910E-2	1.890E-5	4.580E-5	-9.990E-3
Eutrophication potential	[kg $(PO_4)^{3-}$- Eq.]	4.911E-3	3.010E-3	2.730E-5	6.280E-6	-3.170E-4
Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	5.682E-3	1.510E-3	1.980E-5	4.300E-6	-1.790E-3
Abiotic depletion potential for non fossil resources	[kg Sb Eq.]	7.987E-5	2.900E-8	7.340E-10	2.710E-9	-3.820E-5
Abiotic depletion potential for fossil resources	[MJ]	1.571E+2	1.300E+1	5.300E-2	9.460E-2	-3.690E+1

RESULTS OF THE LCA - RESOURCE USE: 1 closer (4.4kg)*

Parameter	Unit	A1 - A3	A4	A5	C4	D
Renewable primary energy as energy carrier	[MJ]	1.650E+1	9.020E-2	2.780E-3	8.160E-3	6.110E-2
Renewable primary energy resources as material utilization	[MJ]	0.000E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
Total use of renewable primary energy resources	[MJ]	1.650E+1	9.020E-2	2.780E-3	8.160E-3	6.110E-2
Non renewable primary energy as energy carrier	[MJ]	1.755E+2	1.400E+1	6.050E-2	1.070E-1	-3.520E+1
Non renewable primary energy as material utilization	[MJ]	0.000E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
Total use of non renewable primary energy resources	[MJ]	1.755E+2	1.400E+1	6.050E-2	1.070E-1	-3.520E+1
Use of secondary material	[kg]	0.000E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
Use of renewable secondary fuels	[MJ]	-1.135E-2	8.080E-5	4.050E-5	1.770E-4	-1.330E-4
Use of non renewable secondary fuels	[MJ]	-1.214E-1	8.500E-4	9.000E-5	3.830E-4	-1.250E-3
Use of net fresh water	[m^3]	3.702E+1	1.200E-1	-3.930E-2	-3.780E-1	-2.770E+0

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 closer (4.4kg)*

Parameter	Unit	A1 - A3	A4	A5	C4	D
Hazardous waste disposed	[kg]	6.594E-3	1.790E-5	1.840E-6	4.440E-6	-5.050E-4
Non hazardous waste disposed	[kg]	7.394E-1	2.620E-4	3.250E-2	5.320E-1	-5.300E-2
Radioactive waste disposed	[kg]	3.887E-3	1.750E-5	9.810E-7	1.730E-6	7.340E-4
Components for re-use	[kg]	0.000E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
Materials for recycling	[kg]	0.000E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
Materials for energy recovery	[kg]	0.000E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
Exported electrical energy	[MJ]	0.000E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
Exported thermal energy	[MJ]	0.000E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0

* 1kg = 2.204 lbs.

Concealed closer environmental impacts are dominated by the product stage (A1-A3) for all impact categories. The production of raw materials such as iron and steel, in particular, are key drivers of environmental performance. The one exception is ozone depletion potential, for which Module D accounts for a significant portion of environmental impact. This is due to differences in primary versus secondary steel production routes, the latter typically leading to higher ozone-depleting emissions from electricity use in electric arc furnaces.

Distribution also accounts for a relevant contribution in a few impact categories. Distribution is modeled assuming a sales-weighted average based on the countries and regions in which closers are sold. Finished products are shipped from DORMA's facility in China to various locations in Europe and Asia. While the results represent DORMA's specific situation as of 2013, they can be reevaluated for a specific country or region.

At the end-of-life, DORMA's closers are modeled as being recycled. A portion of each material type is recovered and the remainder landfilled. In this case, proxy data are used as often, global average or even regional specific data are not available. Waste disposal (Module C4) is consistently a minor contributor to environmental impact so dataset choice is not anticipated to affect conclusions.

References

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PE INTERNATIONAL; GaBi 6: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, Echterdingen, 1992-2013.

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PCR Part B
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