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-20140190-CBD1-EN
Issue date	28.10.2014
Valid to	27.10.2019

8600 and 8900 Series Surface Applied 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.
Panoramastr. 1
10178 Berlin
Germany

Declaration number

EPD-DOR-20140190-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)

8600 and 8900 Series Door Closers

Owner of the Declaration

DORMA Deutschland GmbH
DORMA Platz 1
58256 Ennepetal
Germany

Declared product / Declared unit

The declaration represents one surface applied door closer unit (8600 and 8900 series).

Scope:

The declaration and the background LCA represent DORMA's 8600 and 8900 Series surface applied door closers. Raw materials are provided by suppliers, but the closers are manufactured and assembled at DORMA facilities worldwide. Closer bodies are manufactured at DORMA's Singapore facility and components of the closer arm are manufactured at DORMA facilities in Ennepetal, Germany and Steelville, IL, USA. These parts are then shipped to Reamstown, PA, USA, where the final assembly takes place. 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 8600 and 8900 Series are non-handed surface applied door closers with adjustable spring power (size 1-6) and backcheck that controls opening motion during abusive or abrupt opening.

Supported by a full complement of optional arms, plates, and brackets, the door closers provide the flexibility needed to meet the demands of commercial and institutional applications, including ADA barrier-free accessibility requirements.

The door closers are available with slim plastic, full plastic and full metal cover.

Application

The 8600 and 8900 Series closers are designed for commercial and institutional applications, including ADA barrier-free accessibility requirements.

They are suitable for use on hollow metal, aluminum and wood doors and can be used for fire doors.

Technical Data

The 8600 and 8900 Series have two independent adjustment valves to control the closing speed from 180° - 10° and from 10° - 0°. Optional delayed action adjustable with a separate independent valve delays door closing to allow unobstructed passage through the opening.

Based on arm selection, the mounting options are regular (pull side of the door), top jamb (push side of the door) and parallel arm (push side of the door).

Product certifications include /ANSI A156.4/ Grade 1, /UL 10C/, and /ANSI A117.1/. The closers are also UL and CUL listed, and CSFM (California State Fire Marshall) approved.

Base materials / Ancillary materials

Name	Value	Unit
Steel	62	%
Aluminum	24	%
Oil	6	%

PVC	5	%
Coatings	2	%
Other	1	%

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 8600 or 8900 Series closers.

LCA: Calculation rules

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

Declared unit

Name	Value	Unit
Declared unit (1 closer)	1	1 piece/product
Mass of system (without packaging)	3.0	kg
Conversion factor to 1 kg	0.33	-

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 surface 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
Fuel economy	7.6	mpg
Transport distance (SI)	2400 - 22800	km
Average transport distance (SI)	3,900	km
Transport distance (imperial)	1,500 - 14,200	mi
Average transport distance (imperial)	2,420	mi
Capacity utilisation (including empty runs)	85	%

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site (packaging)	0.2	kg

End of life (C1-C4)

Name	Value	Unit
Recycling	2.1	kg
Landfilling	0.86	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	88	%
Recycling rate, zinc	52	%

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) surface applied 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 (3.0kg)*

Parameter	Unit	A1 - A3	A4	A5	C4	D
Global warming potential	[kg CO_2-Eq.]	2.358E+1	3.920E-1	4.920E-2	3.200E-2	-7.070E+0
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	2.254E-8	2.590E-12	1.660E-13	6.690E-13	3.960E-8
Acidification potential of land and water	[kg SO_2-Eq.]	1.332E-1	3.520E-3	1.670E-4	1.450E-4	-2.770E-2
Eutrophication potential	[kg $(PO_4)^{3-}$- Eq.]	1.329E-2	5.450E-4	7.690E-5	1.690E-5	-1.160E-3
Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	1.019E-2	-3.570E-4	7.220E-5	1.410E-5	-2.570E-3
Abiotic depletion potential for non fossil resources	[kg Sb Eq.]	2.045E-4	1.570E-8	3.110E-9	1.250E-8	-4.750E-5
Abiotic depletion potential for fossil resources	[MJ]	2.963E+2	5.290E+0	1.210E-1	4.900E-1	-6.920E+1

RESULTS OF THE LCA - RESOURCE USE: 1 closer (3.0kg)*

Parameter	Unit	A1 - A3	A4	A5	C4	D
Renewable primary energy as energy carrier	[MJ]	1.991E+1	1.810E-1	5.780E-3	2.330E-2	-1.920E+1
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]	1.991E+1	1.810E-1	5.780E-3	2.330E-2	-1.920E+1
Non renewable primary energy as energy carrier	[MJ]	3.275E+2	5.700E+0	1.350E-1	5.460E-1	-7.130E+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]	3.275E+2	5.700E+0	1.350E-1	5.460E-1	-7.130E+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]	-1.555E-2	3.860E-5	1.380E-4	5.580E-4	-4.750E-5
Use of non renewable secondary fuels	[MJ]	-1.671E-1	4.050E-4	3.160E-4	1.270E-3	-7.960E-4
Use of net fresh water	[m^3]	5.881E+1	1.400E-1	-3.810E-1	-1.550E+0	2.110E+1

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 closer (3.0kg)*

Parameter	Unit	A1 - A3	A4	A5	C4	D
Hazardous waste disposed	[kg]	4.759E-3	1.390E-5	3.120E-6	1.260E-5	-2.320E-6
Non hazardous waste disposed	[kg]	1.355E+0	5.720E-4	1.670E-1	7.070E-1	5.120E-2
Radioactive waste disposed	[kg]	3.732E-3	9.960E-6	1.560E-6	6.280E-6	3.390E-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.

Surface closer environmental impacts are dominated by the product stage (A1-A3) for all impact categories. The production of raw materials such as aluminum 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.

Compared to the product stage, distribution accounts for a small fraction of surface closer environmental impact. 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 Reamstown, PA to various locations in Europe, Asia, and the Americas. 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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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

ANSI A117.1
ANSI A117.1 - 2009, Accessible and usable buildings and facilities

ANSI A156.4
ANSI/BHMA A156.4 - 2013, Door controls — Closers

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

GaBi 6 Documentation
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ISO 14040
EN ISO 14040:2006, Environmental management — Life cycle assessment — Principles and framework

ISO 14044
EN ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines

PCR Part A
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PCR Part B
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UL 10C
UL 10C, Positive pressure fire tests of door assemblies

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