ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	dormakaba International Holding GmbH
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-DOR-20220162-CBA1-EN
Issue date	19.10.2022
Valid to	18.10.2027

TS 91
dormakaba

Institut Bauen und Umwelt e.V.

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ECO PLATFORM EPD VERIFIED

General Information

dormakaba

Programme holder
IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number
EPD-DOR-20220162-CBA1-EN

This declaration is based on the product category rules:
Building Hardware products, 11.2017
(PCR checked and approved by the SVR)

Issue date
19.10.2022

Valid to
18.10.2027

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

Dr. Alexander Röder
(Managing Director Institut Bauen und Umwelt e.V.))

TS 91

Owner of the declaration
dormakaba International Holding GmbH
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Germany

Declared product / declared unit
1 door closer (1 piece) TS 91

Scope:
This Environment Product Declaration refers to a specific door closer manufactured by dormakaba Production GmbH & Co. KG. The production site is located in Singapore.

The data represents the year 2020.

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*
☐ internally ☒ externally

Dr.-Ing. Wolfram Trinius
(Independent verifier)

Product

Product description/Product definition
Designed especially for interior applications, the TS 91 door closer in Contur design offers excellent ease of use due to its linear drive mechanism with heart shaped cam.

For the use and application of the product the respective national provisions at the place of use apply. The standards which can be applied are the following:

- *EN 1154*
- *EN 1634-1*

Application
It can be used for fire and standard interior doors.

Technical Data
The door closer has following technical properties:

Data and features		TS 92 B/G[1]	TS 91 B
Closing force Adjustable	Size	EN 1–4 ●	EN 3 –
Standard doors[2]	≤ 950 mm ≤ 1100 mm	– ●	● –
External doors, outward opening[2]		–	–
For fire and smoke check doors		●	●
Non-handed design		●	●
Arm assembly type	Slide channel	●	●
Closing speed and latching action independently adjustable at two separate valves	180°–15° 15°– 0°	●	●
Cushioned limit stay, mechanical		O	O
Backcheck		–	–
Delayed action		–	–
Hold-open		O	O
Weight in kg		2,0	1,9
Dimensions in mm	Length Overall depth Height	281 47 65	267 47 65
Door closer tested to EN 1154		●	●
CE mark for building products		●	●

● yes – no O optional

[1] B = Standard model for pull-side door leaf fixing/push-side transom fixing
G = Special model for push-side door leaf fixing/pull-side transom fixing.
[2] For particularly heavy doors and doors which have to close against wind resistance, we recommend the TS 93.

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision which can be applied are mentioned above.

Base materials/Ancillary materials

The major material compositions including the packaging of the product are listed below:

Name	Value	Unit
Steel	48	%
Aluminium	32	%
Paper	10	%
Zinc	4	%
Lubricants	3	%
Plastic	2	%
Others	1	%

The product includes partial articles which contain substances listed in the Candidate List of *REACH* Regulation *1907/2006/EC* (date: 17.01.2022) exceeding 0.1 percentage by mass: yes

- Lead (Pb): 7439-92-1 (CAS-No.) is included in some of the alloys used. The concentration of lead in each individual alloy does not exceed 4.0% (by mass).

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

Reference service life

The reference service life of the TS 91 door closer depends on the traffic pattern and degree of usage of the door. These closers are rated to *EN 1154*, meaning they are designed to withstand a minimum of 500,000 cycles. The reference service life amounts for 20 years. This corresponds with approx. 25,000 cycles per year.

LCA: Calculation rules

Declared Unit

The declared unit is 1 piece of the product: TS 91.

Declared unit

Name	Value	Unit
Declared unit	1	piece/product
Mass of declared Product	2.75	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)

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.

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.

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
Information on biogenic Carbon

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic Carbon Content in product	0.01	kg C
Biogenic Carbon Content in accompanying packaging	0.09	kg C

Additional technical information for the declared modules.

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel truck (per piece)	0.00276	l/100km
Transport distance (truck)	500	km
Capacity utilisation (including empty runs) average	55	%
Transport distance (ship)	10000	km

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site (paper packaging)	0.26	kg

End of life (C1-C4)
C1: The product dismantling from the building is done manually without environmental burden.
C2: Transport to waste treatment at end of life is 50km.

Name	Value	Unit
Collected separately	2.49	kg
Recycling	2.31	kg
Energy recovery	0.04	kg
Final deposition	0,14	kg

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

Name	Value	Unit
Recycling	100	%

Collection rate is 100%.

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = 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	ND	ND	MNR	MNR	MNR	ND	ND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 door closer

Core Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO_2-Eq.]	1.93E+1	2.10E-1	3.66E-1	0.00E+0	1.10E-2	1.06E-1	2.00E-3	-7.06E+0
GWP-fossil	[kg CO_2-Eq.]	1.98E+1	2.05E-1	9.00E-3	0.00E+0	1.00E-2	1.06E-1	2.00E-3	-7.03E+0
GWP-biogenic	[kg CO_2-Eq.]	-4.38E-1	5.00E-3	3.57E-1	0.00E+0	4.82E-4	2.48E-6	7.02E-6	-2.10E-2
GWP-luluc	[kg CO_2-Eq.]	7.00E-3	4.59E-6	6.03E-6	0.00E+0	2.48E-7	6.02E-6	5.91E-6	-1.00E-3
ODP	[kg CFC11-Eq.]	8.75E-11	2.06E-17	6.61E-17	0.00E+0	1.10E-18	5.37E-17	7.62E-18	-4.43E-11
AP	[mol H^+-Eq.]	9.50E-2	3.00E-3	1.03E-4	0.00E+0	1.04E-5	1.90E-5	1.47E-5	-2.50E-2
EP-freshwater	[kg P-Eq.]	1.71E-5	4.49E-8	1.29E-8	0.00E+0	2.23E-9	8.56E-9	3.53E-9	-4.51E-6
EP-marine	[kg N-Eq.]	1.55E-2	9.11E-4	3.71E-5	0.00E+0	3.32E-6	4.27E-6	3.79E-6	-3.00E-3
EP-terrestrial	[mol N-Eq.]	1.65E-1	1.00E-2	4.62E-4	0.00E+0	3.69E-5	8.63E-5	4.17E-5	-3.70E-2
POCP	[kg NMVOC-Eq.]	4.70E-2	3.00E-3	9.82E-5	0.00E+0	9.39E-6	1.18E-5	1.15E-5	-1.10E-2
ADPE	[kg Sb-Eq.]	4.79E-4	5.76E-9	1.04E-9	0.00E+0	3.13E-10	7.36E-10	1.85E-10	-1.70E-4
ADPF	[MJ]	2.14E+2	2.72E+0	1.16E-1	0.00E+0	1.48E-1	4.90E-2	2.70E-2	-9.41E+1
WDP	[m^3 world-Eq deprived]	2.74E+0	3.87E-4	4.50E-2	0.00E+0	2.04E-5	1.10E-2	2.15E-4	-4.06E-1

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; WDP = Water (user) deprivation potential

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 door closer

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	3.87E+1	9.00E-3	3.12E+0	0.00E+0	4.66E-4	2.46E-1	4.00E-3	-3.82E+1
PERM	[MJ]	3.34E+0	0.00E+0	-3.10E+0	0.00E+0	0.00E+0	-2.33E-1	0.00E+0	0.00E+0
PERT	[MJ]	4.20E+1	9.00E-3	2.10E-2	0.00E+0	4.66E-4	1.30E-2	4.00E-3	-3.82E+1
PENRE	[MJ]	2.13E+2	2.72E+0	1.16E-1	0.00E+0	1.48E-1	1.58E+0	2.70E-2	-9.41E+1
PENRM	[MJ]	1.53E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-1.53E+0	0.00E+0	0.00E+0
PENRT	[MJ]	2.14E+2	2.72E+0	1.16E-1	0.00E+0	1.48E-1	4.90E-2	2.70E-2	-9.41E+1
SM	[kg]	6.98E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m^3]	1.08E-1	1.57E-5	1.00E-3	0.00E+0	8.37E-7	2.60E-4	6.80E-6	-7.00E-2

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 – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 door closer

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	3.30E-6	2.65E-10	1.71E-10	0.00E+0	1.44E-11	1.88E-10	4.11E-10	-1.54E-6
NHWD	[kg]	3.05E+0	2.78E-4	1.10E-2	0.00E+0	1.51E-5	1.10E-2	1.36E-1	-1.34E+0
RWD	[kg]	4.89E-3	2.97E-6	6.08E-6	0.00E+0	1.59E-7	1.83E-6	3.07E-7	-9.00E-3
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]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.32E+0	0.00E+0	0.00E+0
MER	[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
EEE	[MJ]	0.00E+0	0.00E+0	5.54E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	1.01E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	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

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 door closer

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease Incidence]	2.24E-6	5.72E-8	5.69E-10	0.00E+0	5.49E-11	2.42E-10	1.83E-10	-3.97E-7
IRP	[kBq U235-Eq.]	8.16E-1	4.25E-4	9.41E-4	0.00E+0	2.27E-5	1.65E-4	3.16E-5	-1.83E+0
ETP-fw	[CTUe]	7.26E+1	1.93E+0	5.50E-2	0.00E+0	1.05E-1	1.90E-2	1.50E-2	-3.20E+1
HTP-c	[CTUh]	9.38E-9	3.62E-11	2.90E-12	0.00E+0	1.97E-12	1.60E-12	2.28E-12	3.44E-10
HTP-nc	[CTUh]	2.66E-7	1.62E-9	1.26E-10	0.00E+0	8.43E-11	1.62E-10	2.52E-10	1.13E-7
SQP	[-]	6.62E+1	7.00E-3	3.10E-2	0.00E+0	3.80E-4	1.50E-2	6.00E-3	-2.43E+0

Caption	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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from 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 or as there is limited experienced with the indicator.

References

EN 1154
EN 1154-2003; Building hardware - Controlled door closing devices - Requirements and test methods.

EN 1634-1
EN 1634-1:2018; Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware - Part 1: Fire resistance test for door and shutter assemblies and openable windows.

ISO 14025
DIN EN ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804
EN 15804+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

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

Further References

IBU
Institut Bauen und Umwelt e.V.: General Instructions for the EPDs programme of Institut Bauen und Umwelt e.V. Version 2.0., Berlin: Institut Bauen und Umwelt e.V., 2021. www.ibu-epd.com.

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

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

LCA-tool dormakaba
LCA tool IBU-DOR-202104-LT1-EN, version 1.0, 2021. 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, 2020, Institut Bauen und Umwelt e.V., www.ibu-epd.com.

PCR Part B
PCR – Part B: Requirements on the EPD for Building Hardware product, version 1.2, Institut Bauen und Umwelt e.V., www.ibu-epd.com, 2017.

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