ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	dormakaba International Holding GmbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-DOR-20230097-CBA1-EN
Issue date	22.06.2023
Valid to	21.06.2028

Digital cylinder

dormakaba

www.ibu-epd.com | https://epd-online.com

General Information

dormakaba

Programme holder

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

Declaration number

EPD-DOR-20230097-CBA1-EN

This declaration is based on the product category rules:

Building Hardware products, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

22.06.2023

Valid to

21.06.2028

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

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Digital cylinder

Owner of the declaration

dormakaba International Holding GmbH
DORMA Platz 1
58256 Ennepetal
Germany

Declared product / declared unit

1 piece of the product: Digital cylinder, consisting of the following items:

- Digital cylinder
- Battery
- Assembly screw
- Product packaging

Scope:

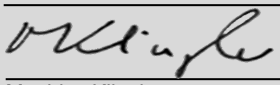
This EPD refers to a specific product manufactured by dormakaba. The production site is located in Wetzikon (Switzerland). Renewable electricity is being used at this production site.

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



Matthias Klingler,
(Independent verifier)

Product

Product description/Product definition

The products are mechatronic cylinder locks with both visual and acoustic access signals. They are compact, energy-efficient and easy to install. The many different versions offer a solution for every door. The digital cylinder is part of the dormakaba evolo standalone portfolio. That means no cabling is required within the door because it is operated with a standard battery. The modular design of the digital cylinder with removable knobs enables quick and easy installation. For the placing on the market in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) the following legal provisions apply:

- *Radio Equipment Directive (RED)*
- *Restriction of Hazardous Substances (RoHS)*

The CE-marking considers the proof of conformity with the respective harmonized standards based on the legal provisions above. For the application and use the respective national provisions apply.

Application

The product can be installed in any internal or external door made of wood, glass or metal. It is also suitable for installation in fire doors.

Technical Data

The digital cylinder has the following technical properties:

Name	Value	Unit
Dimensions cylinder length	from 25/20	mm
to max. cylinder length	220	mm
External knob	36 x 45	mm
Internal knob	36 x 29	mm
Small internal knob	30 x 27	mm
Temperature	-25 to +70	°C
Protection class of external knob	IP56	
Corrosion resistance	Class 3	EN 1670
Battery service life at 20 °C	up to 50.000 cylces	or up to 2 years
Weight (60 mm length)	0,4	kg

The products are not harmonized in accordance with the Construction Product Regulations (CPR) but in accordance with other provisions for harmonization of the EU. Compliance with the European Union Directive and technical specifications:

- *Directive 2014/53/EU (RED)*
- *Directive (EU) No 2011/65 (RoHS)*
- *Regulation (EC) No 1907/2006 (REACH)*
- *EN 15684 (Mechatronic Cylinders)*

The products are subject to CE marking according to the relevant harmonization legislation.

Base materials/Ancillary materials

The composition of the product including the packaging is listed below:

Name	Value	Unit
Brass	45	%
Zinc	23	%
Copper	9	%
Paper	9	%
Plastics	4	%
Battery and electronics	4	%
Stainless steel	3	%
Steel	3	%

The product/s include/s partial articles which contain substances listed in the Candidate List of REACH Regulation *1907/2006/EC* (date: 17.01.2023) 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 Digital cylinders amounts to 10 years and depends on the application and frequency of use. For repairs or renewals, suitable spare parts are available. The product is certified to *EN 15684,* meaning it is designed to withstand a minimum of 100.000 uses.

LCA: Calculation rules

Declared Unit

The declared unit is 1 piece of the product including the packaging: Digital cylinder.

Name	Value	Unit
Declared unit	1	piece/product
Mass (including packaging)	0,45	kg

System boundary

The type of EPD is according to *EN 15804*: *"cradle to gate with options, modules C1–C4, and module D".* The following modules are declared: A1-A3, C, D and additional modules: A4 + A5 + B6

Production - Module A1-A3

The product stage includes:
— A1, raw material extraction, processing of secondary material input (e.g. recycling processes);
— A2, transport to the manufacturer;
— A3, manufacturing and assembly, processing and mechanical treatments, 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, treatment of waste packaging materials arising during installation into the building.

Maintenance – Module B2

This module includes the production and the end of life of the batteries. The potential use of batteries is declared in module B2.

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.
— D, recycling potentials, expressed as net impacts and benefits.

Geographic Representativeness
Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Europe

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 of biogenic carbon

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in accompanying packaging	0.01	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel	0.00276	l/100km
Transport distance	100	km
Capacity utilisation (including empty runs)	55	%

The product is transported via truck. The main distribution region is Europe. In order to allow scaling to a specific point of installation via truck, 100 km are declared.

Installation into the building (A5)

Name	Value	Unit
Waste (paper packaging)	0.04	kg

Maintenance (B2)

Name	Value	Unit
Number of batteries required for lifetime	10	pcs.

dormakaba digital cylinders are operated using a battery and are not connected to mains electricity. The battery is provided by dormakaba. During the operation of the product, the only energy consumption comes from the battery use. The battery must be exchanged in average ten times over the declared service life.

Reference service life

Name	Value	Unit
Life Span according to the manufacturer	10	a

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 50 km.

Name	Value	Unit
Recycling	37	kg
Energy recovery	0.02	kg
Landfilling	0.02	kg
Transportation to Waste Processing Site	50	km

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

Name	Value	Unit
Recycling	100	%

The collection rate is 100 %.

LCA: Results

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

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 piece Digital cylinder

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2.85E+00	3.94E-03	5.67E-02	1.72E-01	0	1.8E-03	4.83E-02	2.7E-04	-8.21E-01
GWP-fossil	kg CO_2 eq	2.91E+00	3.76E-03	1.42E-03	1.71E-01	0	1.72E-03	4.83E-02	2.68E-04	-8.2E-01
GWP-biogenic	kg CO_2 eq	-5.88E-02	1.74E-04	5.53E-02	3.17E-04	0	7.94E-05	1.13E-06	9.17E-07	-4.94E-04
GWP-luluc	kg CO_2 eq	2.42E-03	8.95E-08	9.33E-07	1.65E-04	0	4.09E-08	2.73E-06	7.73E-07	-7.55E-04
ODP	kg CFC11 eq	2.81E-11	3.97E-19	1.02E-17	3.23E-12	0	1.81E-19	2.44E-17	9.96E-19	-3.31E-15
AP	mol H^+ eq	1.91E-02	3.76E-06	1.59E-05	5.36E-04	0	1.72E-06	8.6E-06	1.93E-06	-8.61E-03
EP-freshwater	kg P eq	6.86E-06	8.05E-10	2E-09	2.76E-07	0	3.68E-10	3.88E-09	4.61E-10	-1.2E-06
EP-marine	kg N eq	2.44E-03	1.2E-06	5.73E-06	1.18E-04	0	5.47E-07	1.94E-06	4.96E-07	-9E-04
EP-terrestrial	mol N eq	2.65E-02	1.33E-05	7.15E-05	1E-03	0	6.08E-06	3.92E-05	5.45E-06	-9.74E-03
POCP	kg NMVOC eq	7.49E-03	3.39E-06	1.52E-05	3.22E-04	0	1.55E-06	5.36E-06	1.5E-06	-2.95E-03
ADPE	kg Sb eq	8.11E-04	1.13E-10	1.61E-10	7.54E-07	0	5.15E-11	3.34E-10	2.41E-11	-4.43E-04
ADPF	MJ	4.08E+01	5.33E-02	1.79E-02	2.21E+00	0	2.44E-02	2.24E-02	3.52E-03	-9.57E+00
WDP	m^3 world eq deprived	6.92E-01	7.37E-06	7.03E-03	2.3E-02	0	3.37E-06	4.94E-03	2.81E-05	-2.28E-01

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 piece Digital cylinder

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
PERE	MJ	1.37E+01	1.68E-04	4.83E-01	4.45E-01	0	7.68E-05	5.82E-03	4.61E-04	-1.57E+00
PERM	MJ	4.8E-01	0	-4.8E-01	0	0	0	0	0	0
PERT	MJ	1.42E+01	1.68E-04	3.25E-03	4.45E-01	0	7.68E-05	5.82E-03	4.61E-04	-1.57E+00
PENRE	MJ	4.03E+01	5.34E-02	1.79E-02	2.21E+00	0	2.44E-02	6.68E-01	3.52E-03	-9.57E+00
PENRM	MJ	6.46E-01	0	0	0	0	0	-6.46E-01	0	0
PENRT	MJ	4.1E+01	5.34E-02	1.79E-02	2.21E+00	0	2.44E-02	2.24E-02	3.52E-03	-9.57E+00
SM	kg	2.35E-01	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
FW	m^3	1.82E-02	3.02E-07	1.66E-04	9.99E-04	0	1.38E-07	1.18E-04	8.88E-07	-5.96E-03

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 piece Digital cylinder

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
HWD	kg	2.77E-07	5.18E-12	2.64E-11	2.77E-08	0	2.37E-12	8.53E-11	5.37E-11	-1.44E-07
NHWD	kg	2.37E-01	5.46E-06	1.78E-03	4.2E-02	0	2.49E-06	5.02E-03	1.77E-02	-5.71E-02
RWD	kg	1.82E-03	5.73E-08	9.41E-07	5.14E-05	0	2.62E-08	8.31E-07	4.01E-08	-3.05E-04
CRU	kg	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	3.74E-01	0	0
MER	kg	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	8.58E-02	0	0	0	9.2E-02	0	0
EET	MJ	0	0	1.56E-01	0	0	0	2.11E-01	0	0

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; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 piece Digital cylinder

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
PM	Disease incidence	1.77E-07	1.98E-11	8.8E-11	5.63E-09	0	9.04E-12	1.1E-10	2.38E-11	-8.15E-08
IR	kBq U235 eq	1.99E-01	8.19E-06	1.46E-04	5E-03	0	3.74E-06	7.49E-05	4.13E-06	-3.59E-02
ETP-fw	CTUe	3.14E+01	3.78E-02	8.5E-03	7.55E+00	0	1.73E-02	8.4E-03	2.01E-03	-4.21E+00
HTP-c	CTUh	1.93E-08	7.11E-13	4.49E-13	3.83E-11	0	3.25E-13	7.27E-13	2.98E-13	1.1E-09
HTP-nc	CTUh	1.01E-07	3.04E-11	1.95E-11	4.44E-09	0	1.39E-11	7.36E-11	3.29E-11	1.46E-07
SQP	SQP	1.82E+01	1.37E-04	4.75E-03	2.15E-01	0	6.26E-05	6.71E-03	7.34E-04	-2.09E+00

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.

This EPD was created using a software tool.

References

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

EN 15684
EN 15684:2021-05, Building hardware - Mechatronic cylinders - Requirements and test methods

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

Radio Equipment Directive (RED)
Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC

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

Restriction of Hazardous Substances (RoHS)
Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS), Directive (EU) No 2011/65

Further References

IBU 2021
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 ts software
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/gabi-database-2020-lci-documentation/)

LCA-tool dormakaba
LCA tool, version 1.0, LCA-tool, IBU-DOR-202101-LT1-EN, developed by Sphera Solutions GmbH

PCR Part A
PCR – Part A: Calculation Rules for the Life Cycle As-sessment and Requirements on the Project Re-port according to EN 15804+A2:2019, Version 1.0, 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

Publisher

Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Programme holder

Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Author of the Life Cycle Assessment

dormakaba International Holding GmbH
DORMA Platz 1
58256 Ennepetal
Germany

+49 2333 793-0
info.de@dormakaba.com
www.dormakaba.com

Owner of the Declaration

dormakaba International Holding GmbH
DORMA Platz 1
58256 Ennepetal
Germany

+49 2333 793-0
info.de@dormakaba.com
www.dormakaba.com