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-20210339-CBA3-EN
Issue date	04.05.2022
Valid to	03.05.2028

c-lever compact
dormakaba

Institut Bauen und Umwelt e.V.

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General Information

dormakaba

Programme holder

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

Declaration number

EPD-DOR-20210339-CBA3-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

04.05.2022

Valid to

03.05.2028

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

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

c-lever compact

Owner of the declaration

dormakaba International Holding GmbH
DORMA Platz 1
58256 Ennepetal
Germany

Declared product / declared unit

1 piece of the product: c-lever pro

Scope:

This EPD refers to a specific product manufactured by dormakaba. The production site is located in Shenzhen (China).

The data represent 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

The electronic fitting c-lever compact combines design and functionality. The access medium can be determined according to individual needs - cards, key fobs, keys with Radio Frequency Identification (RFID) or smartphones. Access rights can be defined for an almost unlimited number of users, precisely to the location and time. These can be changed flexibly, either in standalone or wireless operation. The c-lever compact can be integrated into all dormakaba system solutions and supports the latest RFID technologies. With the selectable wireless function you transmit your access rights from your PC to the door components via radio. Benefit from the advantages in terms of security, programming and maintenance. 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:

- *EN 301489:2017*
- *EN 300330:2017*
- *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 c-lever compact is a mechatronical door fitting which does not require any additional cabling and offer a fully wireless, network-compatible electronic locking solution with a range of functions.
Possible fields of application are:

- Interior doors - wooden, metal and glass doors

Technical Data

The c-lever compact has the following technical properties:

Name	Value	Unit
Dimensions (W X H x D)	54,7 x 122,8 x 21,9	mm
Temperature	-25 to +70	°C
Protection class	IP54	
Humidity non-corresponding	0 to 95	%
Battery life at 20 °C	up to 60,000 cylces	or up to 3 years
Weight (without packaging)	0,94	kg
Weight (with packaging)	1,27	kg
Power consumption "on mode"	0,00009	W
Power consumption "standby mode"	0,00009	W

Power supply

- 2 batteries 1.5 V AAA L92, FR3

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

- *EN 300328 V2.1.1:2016-11*
- *EN 300330 V2.1.1: 2017-02*
- *EN 301489-1 V2.2:2017-03*
- *EN 301489-3 V2.2:2017-03*
- *EN 301489-17 V3.1.1:2017-07*
- *EN 50364:2010*
- *EN 60529:2014-09*

The provisions of the *Radio Equipment Directive (RED)* are met. The products are subject to CE marking according to the relevant harmonization legislation.

Base materials/Ancillary materials

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

Name	Value	Unit
Steel	35	%
Paper	26	%
Zinc	16	%
Stainless steel	15	%
Plastics	5	%
Electronics	3	%
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 product is certified according to *EN 1906* and *EN 16867* for 250.000 cycles. Under normal conditions and depending on cycle frequency, door weight etc., it means an approximate duration of 10 years.

LCA: Calculation rules

Declared Unit

The declared unit is 1 piece of the product: c-lever compact.

Declared unit

Name	Value	Unit
Declared unit	1	piece/product
Mass	1.28	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.

Use stage - Module B6
The use stage related to the operation of the building includes:
— B6, operational energy use

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.

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

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	0.12	kg C

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

The following technical scenario information is required for the declared modules.

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel per 1 kg (truck)	0.00276	l/100km
Transport distance (truck)	1000	km
Capacity utilisation (including empty runs)	51	%
Transport distance (ship)	20300	km

Installation into the building (A5)

Name	Value	Unit
Waste packaging (paper)	0.32	kg
Waste packaging (plastic)	0,005	kg

Reference service life

Name	Value	Unit
Life Span according to the manufacturer	10	a

Operational energy use (B6)
The use stage is declared for 10 years.

Name	Value	Unit
Electricity consumption for 1 year	0,003	kWh
Days per year in use	365	days
Power consumption "on mode"	0,06	W
Hours per day in use "on mode"	0,1	h
Power consumption "standby mode"	0,00009	W
Hours per day in use "standby mode"	23,9	h

End of life (C1-C4)
C1: The product dismantling from the building is done manually without environmental burden.

Name	Value	Unit
Collected separately waste type	0.95	kg
Recycling	0.86	kg
Energy recovery	0.05	kg
Final deposition	0,03	kg

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

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 piece c-lever compact

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	1.24E+01	1.97E-01	4.73E-01	1.1E-02	0	4E-03	1.38E-01	4.84E-04	-2.57E+00
GWP-fossil	kg CO_2 eq	1.27E+01	1.92E-01	2.4E-02	1.1E-02	0	4E-03	1.38E-01	4.81E-04	-2.57E+00
GWP-biogenic	kg CO_2 eq	-3.24E-01	5E-03	4.49E-01	3.39E-05	0	1.83E-04	3.22E-06	1.65E-06	6.45E-04
GWP-luluc	kg CO_2 eq	8.13E-03	4.3E-06	8.29E-06	1.54E-05	0	9.43E-08	7.82E-06	1.39E-06	-2E-03
ODP	kg CFC11 eq	1.29E-10	1.93E-17	8.93E-17	2.26E-16	0	4.18E-19	6.97E-17	1.79E-18	-7.23E-15
AP	mol H^+ eq	5.4E-02	3E-03	1.31E-04	2.76E-05	0	3.97E-06	2.46E-05	3.45E-06	-1.6E-02
EP-freshwater	kg P eq	2.22E-05	4.2E-08	1.72E-08	2.75E-08	0	8.48E-10	1.11E-08	8.27E-10	-3.25E-06
EP-marine	kg N eq	1.3E-02	8.6E-04	4.7E-05	5.78E-06	0	1.26E-06	5.55E-06	8.89E-07	-2E-03
EP-terrestrial	mol N eq	1.45E-01	9E-03	5.9E-04	6.11E-05	0	1.4E-05	1.12E-04	9.77E-06	-2.3E-02
POCP	kg NMVOC eq	3.8E-02	2E-03	1.25E-04	1.6E-05	0	3.57E-06	1.54E-05	2.69E-06	-7E-03
ADPE	kg Sb eq	1.02E-03	5.39E-09	1.4E-09	2.99E-09	0	1.19E-10	9.57E-10	4.32E-11	-6.2E-04
ADPF	MJ	1.67E+02	2.55E+00	1.51E-01	1.86E-01	0	5.6E-02	6.4E-02	6E-03	-3.06E+01
WDP	m^3 world eq deprived	2.97E+00	3.62E-04	5.8E-02	2E-03	0	7.77E-06	1.4E-02	5.05E-05	-5.96E-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 c-lever compact

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PERE	MJ	2.55E+01	8E-03	3.92E+00	8E-02	0	1.77E-04	1.7E-02	8.27E-04	-4.8E+00
PERM	MJ	3.89E+00	0	-3.89E+00	0	0	0	0	0	0
PERT	MJ	2.94E+01	8E-03	2.8E-02	8E-02	0	1.77E-04	1.7E-02	8.27E-04	-4.8E+00
PENRE	MJ	1.65E+02	2.55E+00	3.66E-01	1.86E-01	0	5.6E-02	2.12E+00	6E-03	-3.06E+01
PENRM	MJ	2.27E+00	0	-2.15E-01	0	0	0	-2.06E+00	0	0
PENRT	MJ	1.67E+02	2.55E+00	1.51E-01	1.86E-01	0	5.6E-02	6.4E-02	6E-03	-3.06E+01
SM	kg	3.22E-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	8.14E-02	1.47E-05	1E-03	9.54E-05	0	3.18E-07	3.38E-04	1.59E-06	-2.1E-02

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 c-lever compact

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
HWD	kg	3.39E-06	2.49E-10	2.37E-10	7.75E-11	0	5.46E-12	2.44E-10	9.63E-11	-7.37E-07
NHWD	kg	3.18E-01	2.61E-04	1.6E-02	1.29E-04	0	5.75E-06	1.4E-02	3.2E-02	-3.1E-02
RWD	kg	3.56E-03	2.78E-06	7.85E-06	2.72E-05	0	6.04E-08	2.38E-06	7.19E-08	-8.33E-04
CRU	kg	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	8.62E-01	0	0
MER	kg	0	0	0	0	0	0	0	0	0
EEE	MJ	1.42E-01	0	7.2E-01	0	0	0	0	0	0
EET	MJ	2.57E-01	0	1.32E+00	0	0	0	0	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 c-lever compact

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PM	Disease incidence	4.89E-07	5.4E-08	7.43E-10	2.67E-10	0	2.09E-11	3.14E-10	4.27E-11	-2E-07
IR	kBq U235 eq	3.43E-01	3.98E-04	1E-03	4E-03	0	8.63E-06	2.14E-04	7.4E-06	-9.7E-02
ETP-fw	CTUe	1.01E+02	1.8E+00	7.1E-02	7.8E-02	0	4E-02	2.4E-02	4E-03	-1.09E+01
HTP-c	CTUh	2.81E-07	3.39E-11	3.84E-12	2.22E-12	0	7.49E-13	2.08E-12	5.35E-13	9.04E-10
HTP-nc	CTUh	2.85E-07	1.52E-09	1.77E-10	8.27E-11	0	3.2E-11	2.11E-10	5.89E-11	2.96E-07
SQP	SQP	8.59E+01	7E-03	4E-02	5.8E-02	0	1.44E-04	1.9E-02	1E-03	-2.64E+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 IRP
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 ADPE, ADPF, WDP, ETP-fw, HTP-c, HTP-nc, SQP
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 experience with the indicator.

References

Standards

EN 1906
EN 1906:2012, Building hardware - Lever handles and knob furniture - Requirements and test methods; German version EN 1906:2012.

EN 16867
EN 16867:2020, Building hardware - Mechatronic door furniture - Requirements and test methods; German version EN 16867:2020.

EN 15804+A2
EN15804:2019+A2, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

EN 300328 V2.1.1
EN 300328 V2.1.1;2016-11, Wideband transmission systems - Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques - Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU.

EN 300330 V2.1.1
EN 300330 V2.1.1:2017-02, Short Range Devices (SRD) - Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz - Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU (Endorsement of the English version EN 300 330 V2.1.1 (2017-02) as German standard).

EN 301489-1 V2.2
EN 301489-1 V2.2:2017-03, ElectroMagnetic Compatibility (EMC) standard for radio equipment and services - Part 1: Common technical requirements - Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU.

EN 301489-3 V2.2
EN 301489-3 V2.2:2017-03, Electromagnetic compatibility and Radio spectrum Matters (ERM) - ElectroMagnetic Compatibility (EMC) standard for radio equipment and services - Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz - Harmonised Standard covering the essential requirements ofarticle 3.1(b) of Directive 2014/53/EU.

EN 301489-17 V3.1.1
EN 301489-17 V3.1.1:2017-07, ElectroMagnetic Compatibility (EMC) standard for radio equipment and services - Part 17: Specific conditions for Broadband Data Transmission Systems - Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU.

EN 50364
EN 50364:2010, Limitation of human exposure to electromagnetic fields from devices operating in the frequency range 0 Hz to 300 GHz, used in Electronic Article Surveillance (EAS), Radio Frequency Identification (RFID) and similar applications.

EN 60529
EN 60529:2014-09, Degrees of protection provided by enclosures (IP Code, IEC 60529:1989 + A1:1999 + A2:2013).

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

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, 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.

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