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-20210335-CBA8-EN
Issue date	04.05.2022
Valid to	03.05.2028

BEST 45H Mortise Series

dormakaba

Institut Bauen und Umwelt e.V.

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

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-20210335-CBA8-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

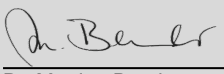
04.05.2022

Valid to

03.05.2028



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



Dr. Martina Bender
(Managing Director Institut Bauen und Umwelt e.V.)

BEST 45H Mortise Series

Owner of the declaration

dormakaba International Holding GmbH
DORMA Platz 1
58256 Ennepetal
Germany

Declared product / declared unit

1 mortise lock (1 piece) of the BEST 45H Series.

Scope:

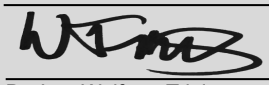
This Environmental Product Declaration refers to a specific lock manufactured by dormakaba. The production site is located in Indianapolis (USA).

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

BEST's 45H series mortise locks deliver exceptional strength, security, and durability. The robust design features and precision-engineered components make the 45H mortise lock series ideal for high traffic applications. Backed by an industry-leading limited lifetime mechanical warranty, the 45H series delivers security you can depend on. 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:

- *ANSI/BHMA A156.13*
- *ANSI A117.1 (Accessibility, ADA* compliant*)*
- *Florida Building Code (FBC) listed*
- *Miami-Dade County Code* compliant
- *UL* listed

Application

The 45H Mortise Series can be used for following building types:

- Learning and higher education
- Healthcare
- Government
- Retail and commercial

Technical Data

The lock has following technical properties:

Certifications	ANSI/BHMA A156.13 Series1000—Grade 1 ANSI A117.1 section 404.2.6 Accessibility Code (ADA compliant) UL listed for three hours on A label doors Florida Building Code (FBC) listed Miami-Dade County Code compliant for WS option
Product Specifications	**Auxiliary bolt:** Stainless steel; non-handed **Latch:** Solid stainless steel 3/4" throw; oil-impregnated for anti-friction; reversible without opening case **Strike:** S1 Standard: 4 7/8" x 1 1/4" x 3/32" non-handed, curved lip; S5 Latchbolt-only: 4 7/8" x 1 1/4" x 3/32" handed, curved lip; S6 Latchbolt/Deadbolt: 4 7/8" x 1 1/4" x 3/32" handed, curved lip **Case:** 0.095" cold rolled steel, zinc dichromate plated for corrosion protection; 5 7/8" x 7/8" x 4 1/16" **Door thickness:** 1 3/4" standard; up to 5" available **Faceplate:** Stainless steel, brass, or bronze; 8" x 1 1/4" x 1/16"; automatically adjusts to proper bevel during installation **Door prep:** ANSI Type 86 cutout **Backset:** 2 3/4" standard

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
Brass	50	%
Steel	29	%
Stainless steel	11	%
Electronics	5	%
Zinc	4	%
Plastics	1	%
Other materials	<1	%

The product/s include/s 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 45H Mortise Series lock depends on the traffic pattern and degree of usage of the door. These locks are rated to *ANSI Grade 1*, meaning they are designed to withstand a minimum of 1,000,000 cycles. However, the 45H Mortise lock has been independently tested to surpass 10,000,000 cycles.

LCA: Calculation rules

Declared Unit

The declared unit is 1 piece of the product: BEST 45H Mortise Series.

Name	Value	Unit
Declared unit	1	piece/product
Mass of declared Product	3.8	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.

Geographic Representativeness

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

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

Characteristic product properties of biogenic carbon

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	-	kg C

Additional technical information 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)	1500	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 (packaging)	0.00017	kg

Operational energy use (B6)

Name	Value	Unit
Electricity consumption for 1 year	28.47	kWh
Power consumption "on mode"	78	W
Hours per day in use "on mode"	1	h
Power consumption "standby mode"	0	W
Hours per day in use "standby mode"	23	h

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 waste type	3.8	kg
Recycling	3.58	kg
Energy recovery	0.024	kg
Final desposition	0,201	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; 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 mortise lock

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	9.94E+00	6.23E-01	2.41E-04	0	0	1.7E-02	6.3E-02	3E-03	-3.28E+00
GWP-fossil	kg CO_2 eq	9.87E+00	6.01E-01	6.04E-06	0	0	1.6E-02	6.3E-02	3E-03	-3.29E+00
GWP-biogenic	kg CO_2 eq	5.3E-02	2.2E-02	2.35E-04	0	0	7.32E-04	1.47E-06	1.04E-05	6E-03
GWP-luluc	kg CO_2 eq	1.15E-02	1.39E-05	3.97E-09	0	0	3.77E-07	3.58E-06	8.78E-06	-3E-03
ODP	kg CFC11 eq	1.03E-11	6.21E-17	4.34E-20	0	0	1.67E-18	3.19E-17	1.13E-17	-2.37E-15
AP	mol H^+ eq	5.2E-02	5E-03	6.75E-08	0	0	1.58E-05	1.13E-05	2.19E-05	-1E-02
EP-freshwater	kg P eq	1.45E-05	1.3E-07	8.5E-12	0	0	3.39E-09	5.09E-09	5.24E-09	-2.95E-06
EP-marine	kg N eq	7.25E-03	1E-03	2.44E-08	0	0	5.04E-06	2.54E-06	5.63E-06	-2E-03
EP-terrestrial	mol N eq	7.5E-02	1.5E-02	3.04E-07	0	0	5.6E-05	5.13E-05	6.19E-05	-2E-02
POCP	kg NMVOC eq	2.17E-02	4E-03	6.46E-08	0	0	1.43E-05	7.03E-06	1.71E-05	-6E-03
ADPE	kg Sb eq	2.04E-03	1.75E-08	6.86E-13	0	0	4.75E-10	4.38E-10	2.74E-10	3.22E-05
ADPF	MJ	1.23E+02	8.27E+00	7.61E-05	0	0	2.24E-01	2.9E-02	4E-02	-3.57E+01
WDP	m^3 world eq deprived	2.15E+00	1E-03	2.99E-05	0	0	3.1E-05	6E-03	3.2E-04	-8.24E-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 mortise lock

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PERE	MJ	2.48E+01	2.6E-02	2E-03	0	0	7.08E-04	2.1E-02	5E-03	-4.26E+00
PERM	MJ	1.5E-02	0	-2E-03	0	0	0	-1.3E-02	0	0
PERT	MJ	2.48E+01	2.6E-02	1.38E-05	0	0	7.08E-04	8E-03	5E-03	-4.26E+00
PENRE	MJ	1.22E+02	8.28E+00	7.61E-05	0	0	2.25E-01	8.41E-01	4E-02	-3.58E+01
PENRM	MJ	8.11E-01	0	0	0	0	0	-8.11E-01	0	0
PENRT	MJ	1.23E+02	8.28E+00	7.61E-05	0	0	2.25E-01	2.9E-02	4E-02	-3.58E+01
SM	kg	2.61E+00	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	6.91E-02	4.72E-05	7.04E-07	0	0	1.27E-06	1.55E-04	1.01E-05	-3.3E-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 mortise lock

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
HWD	kg	3.79E-07	8.05E-10	1.12E-13	0	0	2.18E-11	1.12E-10	6.1E-10	-1.57E-06
NHWD	kg	9.16E-01	8.47E-04	7.55E-06	0	0	2.3E-05	7E-03	2.01E-01	-1.9E-02
RWD	kg	4.97E-03	8.95E-06	4E-09	0	0	2.41E-07	1.09E-06	4.56E-07	-2.93E-04
CRU	kg	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	3.56E+00	0	0
MER	kg	0	0	0	0	0	0	0	0	0
EEE	MJ	1.7E-02	0	3.65E-04	0	0	0	0	0	0
EET	MJ	3.1E-02	0	6.61E-04	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 mortise lock

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PM	Disease incidence	5.96E-07	8.08E-08	3.74E-13	0	0	8.33E-11	1.44E-10	2.71E-10	-2.07E-07
IR	kBq U235 eq	6.77E-01	1E-03	6.19E-07	0	0	3.45E-05	9.81E-05	4.69E-05	-2.3E-02
ETP-fw	CTUe	6.6E+01	5.86E+00	3.61E-05	0	0	1.59E-01	1.1E-02	2.3E-02	-1.1E+01
HTP-c	CTUh	5.9E-07	1.1E-10	1.91E-15	0	0	2.99E-12	9.53E-13	3.39E-12	-1.4E-09
HTP-nc	CTUh	2.46E-07	4.81E-09	8.28E-14	0	0	1.28E-10	9.65E-11	3.74E-10	2.03E-07
SQP	SQP	2.83E+01	2.1E-02	2.02E-05	0	0	5.77E-04	9E-03	8E-03	-1.47E+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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, 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 as there is limited experience with the indicator.

References

ADA (version 1-6)
Americans with Disabilities Act 1990.

ANSI A117.1
ANSI A117.1-2017: Accessible and Usable Buildings.

ANSI/BHMA A156.13
ANSI/BHMA A1564.13:2017 - Mortise Locks.

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

REACH Regulation 1907/2006/EC
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

Florida Building Code
https://floridabuilding.org/c/default.aspx.

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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/).

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Miami-Dade County Code
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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, Institut Bauen und
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UL
Underwriters Laboratories,
https://www.ul.com/.

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