ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	ASSA ABLOY Global Solutions Norway AS
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ASA-20250595-IBA1-EN
Issue date	04/02/2026
Valid to	03/02/2031

Vingcard Novel Mortise Retrofit Lock

ASSA ABLOY Global Solutions Norway AS

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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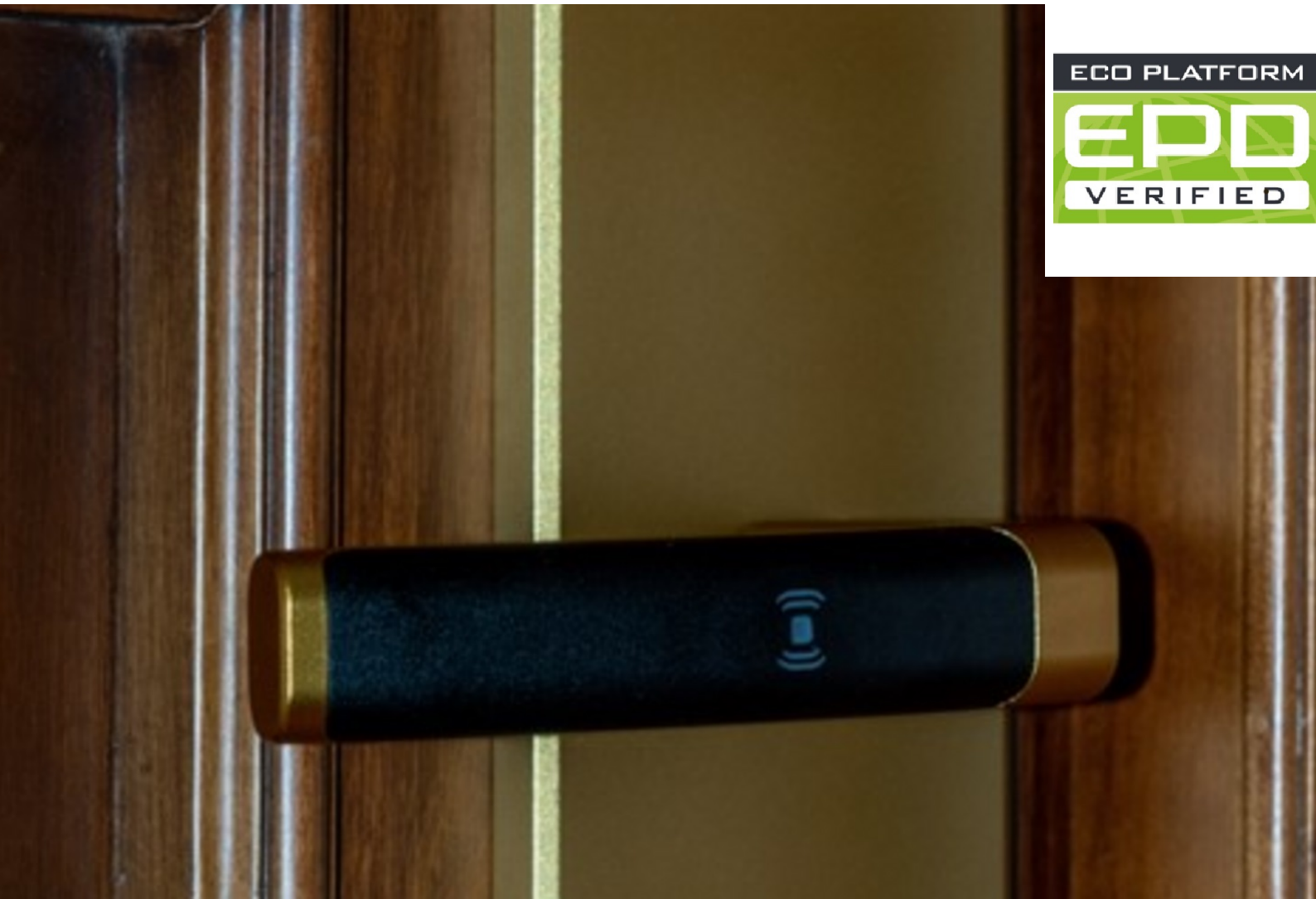

1. General Information

ASSA ABLOY Global Solutions Norway AS

Programme holder

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

Declaration number

EPD-ASA-20250595-IBA1-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

04/02/2026

Valid to

03/02/2031

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

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

Vingcard Novel Mortise Retrofit Lock

Owner of the declaration

ASSA ABLOY Global Solutions Norway AS
Anolitveien 1-3
1400 Ski
Norway

Declared product / declared unit

The declaration represents 1 piece of the lock 'Vingcard Novel Mortise Retrofit Lock' which consists of one handle with electronics, one cover plate, one inside handle on inside cover plate, one electro-mechanical mortise lock case, 3 AA alkaline batteries and a kit with screws and spindles to assemble the lock in a door.

Scope:

This declaration and its LCA study are relevant to the Vingcard Novel Mortise Retrofit Lock manufactured in China.
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)

2. Product

2.1 Product description/Product definition

Product name: Vingcard Novel Mortise Retrofit Lock

Product characteristics:

- The lock consists of an electro-mechanical mortise lock case with electronics and metal parts in steel and stainless steel, in addition to the following decorative aluminium parts: handle on an inside coverplate, handle with reader electronics on an outside coverplate
- The lock includes a hardware kit with steel screws (M5) and spindles for mounting the lock on a door
  The lock also includes a striker plate for the door frame, with a magnet that triggers the locking bolt
- The lock can be used on both wooden and metal doors
- The inside thumbturn escutcheon has 3 holes for fastening the inside of the lock to the outside
- The lock case has one steel locking bolt and a magnetic trigger mechanism that activates the locking bolt once the door is closed into the door frame
- The reader electronics is located in the handle behind a plastic cover, and consists of a microprocessor and antennas for RFID reading/writing, Bluetooth Low Energy (BLE) and Zigbee for online connectivity

For placing on the market in the European Union/European Free Trade Association (EU/EFTA) the following legal provisions apply:

- *RED Directive 2014/53/EU*
- *RoHS Directive 2011/65/EU and Amd. 2015/863/EU*

Standards:

EN 62479: 2010
IEC 62368-1: 2018
EN 301 489-01: V2.2.3
EN 301 489-03: V2.3.1
EN 55032: 2015 +AC: 2016 +A1: 2020
EN 300 330: V2.1.1

The CE-marking considers the proof of conformity with the respective harmonized norms based on the legal provisions above.

For placing on the market in the USA and Canada the following legal provisions apply:

- *FCC Part 15*
- *ISED Certificate (RSS-247 Issue 2 February 2017, RSS-210 Issue 10 December 2019 Amendment (April 2020))*

Additional products standards which apply are:

EN 14846:2008
EN 179:2008
BHMA A156.2

2.2 Application

The Vingcard Novel Mortise Retrofit Lock is designed to cover old door cut-outs in doors when old locks are replaced, both for a wooden and metal doors. The lock is supported both in the Vostio cloud-based software system and the on-premise system Visionline, Its primary area of use is to secure guest room doors and student accommodation rooms, as well as doors located back of house in hotels and student facilities. The lock is compatible with keys presented from a mobile phone using NFC (Wallet keys) and keys sent over Bluetooth Low Energy (Seos ®) The lock also supports multiple RFID cards and tags of type DESfire® EV2 and EV3, MIFARE® Plus EV2, MIFARE® Ultralight AES, MIFARE® Ultralight EV1.
Vingcard Novel Mortise Retrofit has built-in radio for Zigbee to support online connectivity.

2.3 Technical Data

Name	Value	Unit
Available finishes	Natural Aluminium, Gold, Black, Brown, Rose Gold	
Available handles	Standard, EN179, Australia/California	
Power (3 x AA alkaline batteries)	4,5	V DC
User interface	RGB LED (green, red, yellow, blue) and acoustic beeper	
Door thickness	36 - 120 / 1,42 - 4,72	mm / inches
Reader IP rating	IP 56	
Lock case widths	24/0,94, 25/0,98, 28/1,10, 32/1,26	mm / inches
Backset	70 / 2,76	mm / inches

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to EN 14846:2008 (Building hardware - Locks and latches - Electromechanically operated locks and striking plates - Requirements and test methods)

- Class 1 – Category of use: Grade 3
- Class 2 – Durability and load on latch bolt: Grade X*
- Class 3 – Door mass and closing force: Grade 6*
- Class 4 – Suitability for use on fire/smoke doors: Grade C/D*
- Class 5 – Safety: Grade 0
- Class 6 – Corrosion resistance, temperature and humidity: Grade M
- Class 7 – Security and drill resistance: Grade 6
- Class 8 – Security electrical function: Grade 1
- Class 9 – Security electrical manipulation: Grade 0
  (*) Verified by the manufacturer by CE marking

2.4 Delivery status

Vingcard Novel Mortise Retrofit Lock is delivered packed by 1 sets in a box size 354 x 193 x 125 mm.

2.5 Base materials/Ancillary materials

Base materials

The composition of the Vingcard Novel Mortise Retrofit Lock in percentage (%) of total mass is as follows:

Name	Value	Unit
Aluminium	54.7	%
Steel	18	%
Stainless Steel	17.6	%
Electronics	7.1	%
Batteries (3 x AA Alkaline)	2.1	%
Plastics	0.5	%
Total	100	%

2.6 Manufacture

The manufacturing processes are done in China, as a joint effort between the ASSA ABLOY Global Solutions factory in Shanghai and its sub suppliers located in various distances

from the factory. The following processes are included:

1. Aluminium extrusion and machining
2. Plastic injection moulding
3. Colour anodization
4. Metal stamping
5. Electronics manufacturing and assembly
6. Assembly and packaging of complete lock sets

Industrial Waste is sent for disposal. Waste codes according to European Waste Catalogue and Hazardous Waste List -Valid from 1 July 2015.

- *EWC 15 01 01* Paper and cardboard packaging
- *EWC 17 02 03* Plastic
- *EWC 17 04 02* Aluminium
- *EWC 17 04 05* Iron and steel
- *EWC 17 04 11* Cables with the exception of those outlined in *EWC 17 04 10*
- *EWC Code 20 01 35* Electronics
- *EWC Code 20 01 33* Batteries

2.7 Environment and health during manufacturing

ASSA ABLOY Global Solutions is committed to producing and distributing solutions with minimal environmental impact, where health & safety is the primary focus for all employees and associates.

Environmental operations, energy, water, waste, and H&S are routinely monitored. Inspections, audits, and reviews are conducted periodically.

The factory of ASSA ABLOY Global Solutions in Shanghai has a quality management system certified according to *ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018.*

ASSA ABLOY Code of Conduct covers human rights, labour practices and decent work. Management of ASSA ABLOY is aware of their environmental roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance.

Any waste metals during machining are separated and recycled.

The factory in Shanghai utilizes solar panels that cover the roof of the building, as well as LED lighting for lower power consumption.

2.8 Product processing/Installation

Vingcard Novel Mortise Retrofit Lock is distributed through the company's own business units located around the world, as well as trained distributors. The product is installed by trained installation technicians from mentioned business units and partners, in addition to local locksmiths, carpenters etc. that adheres to local/national standards and requirements.

2.9 Packaging

Vingcard Novel Mortise Lock is packed by 1 set in a cardboard box. The packaging is fully recyclable and has the box size 354 x 193 x 125 mm.

2.10 Condition of use

The lock can be used indoors and outdoors in any climate. Batteries must be changed upon low battery warning. No additional lubrication shall be applied to the inside of the Novel lock case after leaving the factory.

2.11 Environment and health during use

There is no harmful emissive potential. No damage to health or impairment is expected under normal use corresponding to the intended use of the product.

2.12 Reference service life

The lock, excluding batteries, is approved for 1 000 0000 cycles under normal working conditions. Battery lifetime will depend on types of batteries used, frequency of use and whether the lock is part of an online system or not and will typically vary from 2 to 5 years.

2.13 Extraordinary effects

Fire

Fire certified according to *EN 1634-1:2014+A1:2018* (Fire resistance and smoke control tests for door and shutter assemblies, open-able windows and elements of building hardware — Part 1: Fire resistance test for door and shutter assemblies and open-able windows) for 30 min and 60 min rated wooden doors.

The product does not contribute to the spread of fire, in case of a fire, and there is no harmful potential for environment and health.

Water

Contains no substances that have any impact on water in case of flood.

Mechanical destruction

No danger to the environment can be anticipated during mechanical destruction. If AA Alkaline battery cells are opened or leaking, exposure to the body should be avoided due to possible irritation. First aid measures to be taken, according to Alkaline battery health datasheets.

2.14 Re-use phase

The product is possible to re-use during its reference service life and can be moved from one door to another. The majority of components is aluminium, stainless steel and steel, which can be re-cycled. The metal parts can be dis-assembled to separate the different materials.

The plastic parts and cardboard packaging are sent to the waste incineration plant for its energy recovery.

Waste codes according to the European Waste Catalogue and Hazardous Waste List - Valid from 1 July 2015.

- *EWC 17 04 02 Aluminium*
- *EWC 17 04 05 Iron and steel*
- *EWC 17 02 03 Plastic*
- *EWC 17 04 11 Cables except for those outlined in EWC 17 04 10*
- *EWC Code 20 01 35* Electronics*
- *EWC Code 20 01 33* Batteries EWC Code 20 01 01 Paper*

2.15 Disposal

The product can be mechanically disassembled to separate the different materials. The majority of components are steel and aluminium, which will be recycled. The plastic components are used for energy recovery in an incineration plant. No disposal is foreseen for the product, nor for the corresponding packaging.

2.16 Further information

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1400 Ski, NORWAY

3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of Vingcard Novel Mortise Retrofit Lock as specified in Part B requirements on the EPD IBU: PCR Building Hardware products. Functional unit for module B2: Use of 1 piece of Vingcard Novel Mortise Retrofit Lock for 10 years.

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	pce.
Mass (including 3 batteries without packaging)	3.37	kg
Mass packaging (paper)	0.468	kg
Mass reference	3.37	kg/pce

3.2 System boundary

Type of the EPD: cradle to gate - with options (A1-A3 and additional modules A4 and A5). The following life cycle stages were considered:

Production stage:
A1 – Raw material extraction and processing
A2 – Transport to the manufacturer and
A3 – Manufacturing

Construction stage:
A4 - Transport from the gate to the site
A5 – Packaging waste processing

Use stage related to the operation of the building includes:
B2 – Maintenance (replacement of batteries)

End-of-life stage:
C1- Deconstruction/demolition at End-of-life stage
C2 – Transport to waste processing,
C3 – Waste processing for recycling and
C4 – Disposal (landfill, waste for incineration).

This includes provision of all materials, products and energy, packaging processing and its transport, as well as waste processing up to the end-of-waste state or disposal of final residues. Benefits and loads beyond the system boundaries: D –Declaration of all benefits and loads.

3.3 Estimates and assumptions

Transportation: Data on the mode of transport and distances, as reported by suppliers were used for those materials and parts contributing more than 2 % of the total product mass. Incase of unknown transport distances for parts and materials, contributing less than 2 % to the total product mass, transport by road over an average distance of 500 km was assumed.

Use stage: For the use phase, it is assumed that the Vingcard Novel Mortise Retrofit Lock is used in Europe. According to the most representative scenario, the number of batteries required for functioning of the lock is 3, and the number of battery replacements required is 2.

EoL: In the End-of-Life stage, for all the materials from the product which can be recycled (steel, aluminium, electronic parts, electro-mechanics and stainless steel), a recycling scenario with 100 % collection rate was assumed. The paper and plastic components are sent for energy recovery within a waste incineration process. EoL is assumed to happen within EU-28. Furthermore, a transport distance by truck of 100 km has been assumed in the model.

3.4 Cut-off criteria

In the assessment, all available data from the production process are considered, i.e. all raw materials used, auxiliary materials (e.g. lubricants), and electric power consumption - including material and energy flows contributing less than 1% of mass or energy (if available). In case a specific flow contributing less than 1% in mass or energy is not available, worst-case assumption proxies are selected to represent the respective environmental impacts. Impacts relating to the production of machines and facilities required during production are out of the scope of this assessment.

3.5 Background data

For life cycle modelling of the considered product, *Sphera's Life Cycle for Expert* (LCA FE) software is used. *Sphera's Managed Lifecycle Content* (MLC) modelling database is used as the background database of the study.

3.6 Data quality

The requirements for data quality and background data correspond to the specifications of the *IBU PCR Part A. Sphera* performed a variety of tests and checks during the entire project to ensure a high quality of the completed project. This obviously includes an extensive review of project-specific LCA models, as well as the background data used. The technological background of the collected data reflects the physical reality of the declared products. The datasets are complete and conform to the system boundaries and the criteria for the exclusion of inputs and outputs. All relevant background datasets are taken from *Sphera's MLC database*.

3.7 Period under review

The period under review is, 2024 (12-month average).

3.8 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

3.9 Allocation

Regarding incineration, the software model for the waste incineration plant (WIP) is adapted according to the material composition and heating value of the combusted material. In this EPD, the following specific life cycle inventories for the WIP are considered for:
- Waste incineration of paper
- Waste incineration of Plastic
- Waste incineration of Wood

Regarding the recycling material of metals, the metal parts in the EoL are declared as end-of-waste status. Thus, these materials are considered in module D. Specific information on allocation within the background data is given in the MLC dataset documentation.

3.10 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. Sphera's Managed LCA Content CUP 2024.2 serves as background database for the calculation.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The following technical information is a basis for the declared modules or can be used for developing specific scenarios in the context of a building assessment if modules are not declared (MND).

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	0.2	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	27.5	l/100km
Transport distance by truck	800	km
Capacity utilisation (including empty runs)	61	%
Transport distance by ship	13500	km

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site (paper/cardboard packaging)	0.468	kg

Reference service life

Name	Value	Unit
Life Span according to the manufacturer	10	years

Maintenance (B2)

Name	Value	Unit
Batteries required for functioning of the Lock	3	pcs
Number of battery changes required	2	times

End of life (C1-C4)

Name	Value	Unit
Transport to EOL (C2)	100	km
Collected separately waste type (aluminium, steel, plastics, stainless steel, electronic, electromechanics etc.)	3.37	kg
Incineration of plastic parts	0.02	kg
Recycling (aluminium, steel, electronic, electro-mechanics, stainless steel)	3.29	kg
Landfill	0.08	kg

3 AA batteries (14g each) are sent to landfill (C4).

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

Name	Value	Unit
Collected separately waste type (including packaging)	3.77	kg
Recycling aluminium	48.94	%
Recycling stainless steel	15.74	%
Recycling electronics	6.33	%
Recycling steel	16.12	%
Incineration of plastic parts	0.45	%
Incineration of packaging (paper) (from A5)	10.76	%

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5. 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	X	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 piece Vingcard Novel Mortise Retrofit Lock

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2.51E+01	1.37E+00	6.63E-01	2.2E+00	0	0	2.92E-02	4.53E-01	4.51E-02	-1.91E+01
GWP-fossil	kg CO_2 eq	2.68E+01	1.36E+00	1.55E-02	2.12E+00	0	0	2.86E-02	4.51E-01	5.11E-03	-1.91E+01
GWP-biogenic	kg CO_2 eq	-7.39E-01	1.6E-03	6.48E-01	7.82E-02	0	0	6.84E-05	9.57E-04	4E-02	-2.94E-02
GWP-luluc	kg CO_2 eq	2.45E-02	4.34E-03	1.03E-05	8.13E-06	0	0	4.81E-04	7.59E-05	4.07E-06	-7.74E-03
ODP	kg CFC11 eq	1.15E-10	1.23E-13	9.05E-14	4.39E-11	0	0	4.22E-15	2.57E-12	4.31E-15	-1.52E-11
AP	mol H^+ eq	1.5E-01	3.74E-02	1.85E-04	1.01E-02	0	0	3.92E-05	4.37E-04	1.21E-05	-1.13E-01
EP-freshwater	kg P eq	5.5E-05	1.39E-06	2.58E-08	5.11E-06	0	0	1.22E-07	5.16E-07	9.41E-07	-7.69E-06
EP-marine	kg N eq	2.34E-02	8.83E-03	6.8E-05	2.12E-03	0	0	1.42E-05	1.58E-04	1.13E-05	-1.8E-02
EP-terrestrial	mol N eq	2.57E-01	9.68E-02	8.46E-04	2.78E-02	0	0	1.69E-04	1.81E-03	4.57E-05	-1.98E-01
POCP	kg NMVOC eq	7.16E-02	2.52E-02	1.8E-04	5.5E-03	0	0	3.91E-05	4.15E-04	2.7E-05	-5.46E-02
ADPE	kg Sb eq	9.3E-04	4.65E-08	9.57E-10	6.27E-06	0	0	2.49E-09	2.09E-08	9.21E-11	-4.61E-04
ADPF	MJ	3.25E+02	1.64E+01	2.04E-01	2.68E+01	0	0	3.77E-01	2.7E+00	3.19E-02	-2.16E+02
WDP	m^3 world eq deprived	8.15E+00	5.98E-03	8.23E-02	6.92E-01	0	0	4.43E-04	9.97E-02	1.89E-04	-7.29E+00

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 Vingcard Novel Mortise Retrofit Lock

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
PERE	MJ	1.45E+02	3.56E-01	7.98E+00	1.97E+00	0	0	3.25E-02	1.66E+00	3.39E-03	-1.09E+02
PERM	MJ	7.93E+00	0	-7.93E+00	0	0	0	0	0	0	0
PERT	MJ	1.53E+02	3.56E-01	5.58E-02	1.97E+00	0	0	3.25E-02	1.66E+00	3.39E-03	-1.09E+02
PENRE	MJ	3.21E+02	1.64E+01	2.04E-01	2.68E+01	0	0	3.77E-01	6.56E+00	3.19E-02	-2.16E+02
PENRM	MJ	3.87E+00	0	0	0	0	0	0	-3.87E+00	0	0
PENRT	MJ	3.25E+02	1.64E+01	2.04E-01	2.68E+01	0	0	3.77E-01	2.7E+00	3.19E-02	-2.16E+02
SM	kg	6.66E-01	0	0	0	0	0	0	0	0	2.38E+00
RSF	MJ	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0
FW	m^3	2.73E-01	4.04E-04	1.94E-03	1.61E-02	0	0	3.62E-05	2.87E-03	5.52E-06	-2.66E-01

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 Vingcard Novel Mortise Retrofit Lock

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
HWD	kg	9.79E-04	5.35E-10	1.16E-10	1.95E-03	0	0	1.44E-11	3.37E-09	5.74E-12	7.24E-09
NHWD	kg	6.29E+00	1.8E-03	2.09E-02	1.49E+00	0	0	6.16E-05	8.36E-02	3.24E-02	-7.05E+00
RWD	kg	1.16E-02	2.11E-05	1.03E-05	9.25E-04	0	0	6.87E-07	3.49E-04	4.03E-07	-8.45E-03
CRU	kg	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	3.05E+00	0	0
MER	kg	0	0	0	0	0	0	0	4.17E-01	0	0
EEE	MJ	1.31E-03	0	1E+00	0	0	0	0	5.74E-01	0	0

EET	MJ	3.04E-03	0	1.82E+00	0	0	0	0	1.29E+00	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 Vingcard Novel Mortise Retrofit Lock

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
PM	Disease incidence	2.3E-06	6.5E-07	1.02E-09	1.48E-07	0	0	3.93E-10	1.46E-10	1.22E-10	-1.98E-06
IR	kBq U235 eq	1.65E+00	2.96E-03	1.62E-03	9.46E-01	0	0	9.97E-05	7.39E-04	6E-05	-8.24E-01
ETP-fw	CTUe	1.65E+02	1.21E+01	8.94E-02	1.2E+02	0	0	2.8E-01	4.03E-02	4.46E-02	-6.81E+01
HTP-c	CTUh	1.37E-06	2.25E-10	5.31E-12	5.34E-10	0	0	5.65E-12	2.2E-12	8.15E-13	-6.26E-07
HTP-nc	CTUh	2.17E-07	7.82E-09	1.05E-10	3.58E-08	0	0	2.54E-10	8.95E-11	6.96E-11	-1.5E-07
SQP	SQP	2.62E+02	1.71E+00	6.23E-02	1.21E+00	0	0	1.86E-01	5.06E-02	3.47E-03	-1.04E+01

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.

6. LCA: Interpretation

This chapter contains an interpretation of the Life Cycle Impact Assessment categories. Stated percentages in the whole interpretation are related to the overall life cycle, excluding credits (module D). The environmental impacts for the transport (A2) have a negligible impact within this stage.
The production stage (modules A1-A3) contributes between 71% and 99% to the overall results for all core environmental impact assessment categories. Biogenic carbon intake is mainly related to the extraction of renewable raw materials (A1).

Within the production stage, the main contribution for all the impact categories is the production of steel and aluminum mainly due to the energy consumption of these processes.

To reflect the use stage (module B2) for a service life of 10 years, replacement (production and end of life) of batteries twice was included in this declaration, and it has a minor to medium contribution for all core impact assessment categories considered - between 0.41% and 23%.
In the end-of-life stage, there are loads and benefits (module D, negative values) considered. The benefits are considered beyond the system boundaries and are declared for the recycling potential of the metals and for the credits from the incineration process (energy substitution).

7. Requisite evidence

Not applicable in this EPD

8. References

Standards, norms, directives

EN 15804
EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

EU/EFTA directives
RED Directive 2014/53/EU
RoHS Directive 2011/65/EU
Amd. 2015/863/EU

EN 62479: 2010 (Assessment of the compliance of low-power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz))

IEC 62368-1: 2018 (Audio/video, information and communication technology equipment - Part 1: Safety requirements)

EN 301 489-01: V2.2.3 (ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility)

EN 301 489-03: V2.3.1 (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 for ElectroMagnetic Compatibility)

EN 55032: 2015 +AC: 2016 +A1: 2020 (Electromagnetic compatibility of multimedia equipment - Emission Requirements)

EN 300 330: V2.1.1 (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 Directive 2014/53/EU)

EN 1634-1:2014+A1:2018 (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)

FCC Part 15 (RADIO FREQUENCY DEVICES)

ISED Certificate (RSS-247 Issue 2 February 2017) (Digital Transmission Systems, Frequency Hopping Systems and Licence-Exempt Local Area Network Devices in 902-928 MHz, 2400-2483.5 MHz, 5150-5350 MHz, and 5470-5895 MHz bands)

ISO 9001:2015 Quality management systems — Requirements

ISO14001:2015 Environmental management systems — Requirements with guidance for use

ISO45001:2018 Occupational health and safety management systems — Requirements with guidance for use

RSS-210 Issue 10 December 2019 Amendment (April 2020) (Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices) (Licence-Exempt Radio Apparatus: Category I Equipment)

EN 14846:2008 (Building hardware - Locks and latches - Electromechanically operated locks and striking plates - Requirements and test methods)

EN 179:2008 (Building hardware - Emergency exit devices operated by a lever handle or push pad, for use on escape routes - Requirements and test methods)

BHMA A156.2 (American National Standard for Bored & Preassembled Locks and Latches)

UL 10C (20,45 and 90min)

EWC: European Waste Classification for Statistics (EWC-Stat) Version 4 (2010)

EWC 17 04 02 Aluminum
EWC 17 04 05 Iron and steel
EWC 17 02 03 Plastic
EWC 17 04 11 Cables except for those outlined in EWC
EWC Code 20 01 35 Electronics
EWC Code 20 01 33 Batteries

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Sphera's Life Cycle for Expert (LCA FE) software:
Sphera Solutions, 'Life Cycle Assessment for Expert software', Sphera Solutions, Chicago, US, 2023.
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IBU PCR Part A
Institut Bauen und Umwelt e.V., Berlin (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report Version 1.4 04.2024 www.ibu-epd.de

IBU PCR Part B
IBU PCR Part B: PCR Guidance-Texts for Building-Related Products and Services. From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU). Part B: Part B: Requirements on the EPD for Building Hardware products (08.2021) www.ibu-epd.com

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General Instructions for the EPD programme of Institut Bauen und Umwelt e.V. Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021.
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