

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	Royal Boon Edam International B.V.
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-BEN-20250732-IBA1-EN
Issue date	12/01/2026
Valid to	11/01/2031

CIRCLELOCK

Royal Boon Edam International B.V.

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EPD
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1. General Information

Royal Boon Edam International B.V.

Programme holder

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

Declaration number

EPD-BEN-20250732-IBA1-EN

This declaration is based on the product category rules:

Automatic doors, automatic gates, and revolving door systems,
01/08/2021
(PCR checked and approved by the SVR)

Issue date

12/01/2026

Valid to

11/01/2031



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



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

CIRCLELOCK

Owner of the declaration

Royal Boon Edam International B.V.
Ambachtstraat 4
1135GG Edam
Netherlands

Declared product / declared unit

The declaration represents one automatic security door, consisting of a round enclosure with two (2) curved sliding doors that open one after the other. The door is used in locations where a high level of security is required. It has a diameter of 1500 mm, a height under canopy of 2200 mm and 2500 mm total height.

Scope:

Raw materials and components are provided by suppliers from around the globe and shipped to Boon Edam, where the product is manufactured and assembled before being shipped and installed on a construction site in Europe.

The energy use on-site and maintenance during the 20 years of use are both taken into account.

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	
<input type="checkbox"/>	internally
<input checked="" type="checkbox"/>	externally



Mrs Kim Allbury,
(Independent verifier)

2. Product

2.1 Product description/Product definition

The Circlelock offers the highest level of physical security, making it the ultimate solution to prevent unauthorized access to sensitive areas of a building and allows only one person at a time. The round, cylindrical compartment features two interlocking, automatic sliding doors. Upon authorisation, the first door opens allowing a user to enter the portal. Integrated sensors confirm the user is alone and if so, a signal is given to the second sliding door to open, completing the passage into a secure area.

For the product studied in this document, the following options were selected:

- Diameter of 1500 mm and a height under canopy of 2200 mm
- Glass curved walls
- Automated drive positioned in the canopy
- Security system: StereoVision
- Lighting, with 2x LEDs

For the placing on the market in the EU/EFTA (with the exception of Switzerland) the following legal provisions apply:

- 2006/42/EC
- EMC directive 2014/30/EU
- EN 17352
- EN 60335
- EN ISO 13849
- EN 61000

The CE-marking takes into account the proof of conformity with the respective harmonised norms based on the legal provisions above.

For the application and use the respective national provisions apply.

2.2 Application

Circlelocks are intended to be used in buildings where a higher level of security is required, in particular in:

- Data centres
- Financial
- Insurance
- Medical / pharmaceutical
- Government / military
- Airports
- Prisons
- Museums
- Archives
- Casinos

2.3 Technical Data

Constructional data

The CIRCLELOCK is a product installed inside buildings. Most constructional data don't apply to it.

Name	Value	Unit
Heat transfer coefficient of the entire door or gate system acc. to EN 16361	5.6	W/(m ² K)
Power input "Standby"	45	W
Power input "Operation"	200	W

Performance data of the product according to the harmonised standards, based on provisions for harmonization.

2.4 Delivery status

The Circlelock modelled for this study is delivered ready for installation in a wooden packaging, with a total weight of 599

kg.

It presents the following dimensions:

- External diameter: 1576 mm
- Internal diameter: 1500 mm
- Height: 2500 mm
- Height under canopy: 2200 mm

2.5 Base materials/Ancillary materials

Name	Value	Unit
Glass (tempered) 49%	221	kg
Aluminium 29%	130	kg
High Pressure Laminate 7%	33.6	kg
Electrical components 4%	17	kg
Drive parts 4%	17	kg
Steel 3%	12	kg
Elastomers 3%	12	kg
Fasteners 1%	4	kg
Other plastics 1%	4	kg
Stainless Steel 0%	0.4	kg

Boon Edam use substances on their own or in a preparation within its industrial or commercial activities, and is therefore a downstream user as defined in *Article 3 No. 13 of Regulation (EC) No. 1907/2006 (so-called REACH regulation)*. As a downstream user, Boon Edam has already requested that all suppliers provide confirmation regarding the correct implementation of REACH, and that our products do not contain SVHCs with a concentration greater than 0.1 percent by weight, as for the list published on the 7th of July 2017. Thus, the following declarations hold true for a CIRCLELOCK:

1. Contains substances on the candidate list of SVHC(date:25.01.2021) exceeding 0.1 percentage by mass in at least one partial product: **No**
2. Contains other carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass in at least one partial product : **No**
3. Biocide products were added to this construction product or it has been treated with biocide products(this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012): **No**

2.6 Manufacture

All materials are shipped from suppliers to Boon Edam Manufacturing EMEA site in Edam, The Netherlands. Depending on the product, steel and aluminium profiles are cut to shape and size on site, and are assembled with the rest of the materials by Boon Edam.

The manufacturing site in Edam is ISO 9001 certified.

2.7 Environment and health during manufacturing

Standard cutting and coating machinery are used on-site. Safety measures are implemented on-site and employees are required to wear personal protective equipment. Boon Edam's Manufacturing EMEA site in Edam, Netherlands, has set-up several take-back schemes, with customers in the Netherlands and with suppliers. Metal cuttings from production (steel and aluminium alloys) are collected and sent back to suppliers to be reprocessed. The site is ISO 14001 certified.

2.8 Product processing/Installation

Boon Edam's installation teams in Europe are following a strict safety process to define, together with the clients, safe access and working conditions during the installation. A list of personal protective equipment to be worn for each different task is defined as part of this process.

2.9 Packaging

Packaging materials should be discarded according to the regulations in place in the country of installation, and can be recycled or incinerated (for energy recovery) once the product is installed.

The following materials are used for packaging:

- Wood - 145 kg
- Cardboard - 2 kg
- LDPE sheet - 1 kg
- Paper - 0.22 kg

2.10 Condition of use

Maintenance instructions are provided by Boon Edam, and will ensure efficient operations of the product. Annual maintenance checks are advised, and should be carried out by Boon Edam or an approved agent.

The materials used in the composition of Boon Edam products are very stable, and their composition is not expected to change in the time frame of use of the product, provided the advised maintenance procedures are respected.

2.11 Environment and health during use

The products manufactured by Boon Edam do not release any fluid, fumes, or chemical substances if used in accordance with the specifications provided, and if proper maintenance checks are performed regularly.

Automatic doors and gates are fitted with safety sensors and actuators that will prevent any physical damage in case of malfunction or improper use.

2.12 Reference service life

To calculate the indicators for potential impact during the use stage of a Circlelock, a service life of 20 years has been selected, as suggested in the 'Nutzungsdauern von Bauteilen' (Service Lives of Components) from the BBSR. Provided that proper maintenance procedures are followed, the characteristics of the installed product will remain stable over the years and will not suffer from ageing of materials or components. NB: A service life in accordance with the BBSR table is not a RSL according to ISO 15686.

2.13 Extraordinary effects

Fire

Fire protection

Name	Value
Building material class	Class D
Burning droplets	Class d0
Smoke gas development	Class s1

3. LCA: Calculation rules

3.1 Declared Unit

The declaration represents one automatic security door, consisting of a round enclosure with two (2) curved sliding doors that open one after the other. The door is used in locations where a high level of security is required. It has a diameter of 1500 mm, a height under canopy of 2200 mm and 2500 mm total height.

The declaration and background LCA report represent an automatic security door from Boon Edam Circlelock, type CL. Raw materials and components are provided by suppliers from

Water

Automatic doors contain electric and electronic equipment that may malfunction in the event of contact with water. Please refer to instructions regarding maintenance and cleaning.

No impact on the environment will occur in case of such malfunction.

Mechanical destruction

Mechanical destruction will never result from a malfunction of the door or gate itself.

In case mechanical destruction is caused by an external event, no environmental damage will be caused.

A damaged door or gate will need to be deconstructed with care and replaced.

2.14 Re-use phase

At the end-of-life, Boon Edam Netherlands and several Boon Edam entities in other European countries, offer a take back scheme. Products that reached their end-of-life can be dismantled by Boon Edam, and transported to local recycling or to the waste separation facility of Boon Edam in Edam.

Parts obtained from dismantled doors are not reused, for quality and safety reasons, but materials are separated and prepared for recycling.

2.15 Disposal

Waste materials are produced at the end-of-life of the product. They are listed below according to the European List of Waste 2014/955/EU.

- 16 02 Wastes from electrical and electronic equipment
- 17 02 01 Wood
- 17 02 02 Glass
- 17 02 03 Plastic
- 17 04 02 Aluminium
- 17 04 05 Iron and steel
- 17 04 11 Cables (with no hazardous substances)

Products that reached their end-of-life can be dismantled by Boon Edam on location and transported to local recycling or to the waste separation facility of Boon Edam in Edam.

2.16 Further information

See contact details.

around the globe and shipped to Boon Edam, where the doors are manufactured and assembled before being shipped and installed on a construction site in Europe.

The energy use on site and maintenance during the 20 years of use are taken in account.

It is fitted with two (2) 230V 'ODG 534 motors' of 90W.

Declared unit and mass reference

Name	Value	Unit
Mass (total system)	599	kg
conversion factor to 1 kg	0.0017	-
Declared unit	1	pce.
Mass reference	599	kg/pce

3.2 System boundary

Type of EPD: cradle-to-grave.

The following modules were considered in this analysis:

- **Product stage (A1–A3)**

The product stage includes raw material extraction and processing (A1), transport of raw materials and components to the manufacturing site (A2), and manufacturing and assembly of the product (A3). Energy use, internal transport, packaging materials, and treatment of production waste are included.

The electricity used on site by the revolving door is supplied via the building's electrical system and is modelled using the standard Dutch residual electricity mix, with a value of 0.417 kg CO₂-eq/kWh.

- **Construction stage (A4–A5)**

The construction stage covers transport of the finished product to the building site (A4) and installation activities (A5), including handling and disposal of packaging materials. No additional auxiliary materials are required beyond those included in the product system.

- **Use stage (B2, B6)**

The use stage includes routine maintenance activities (B2) and electricity consumption during normal operation (B6). No materials are required during use (B1) and no water is needed for operation (B7). Repair (B3), replacement (B4), and refurbishment (B5) are not required under normal use and proper maintenance and are therefore not declared.

- This EPD follows additional requirements for EEE-products.

- **End-of-life stage (C1–C4)**

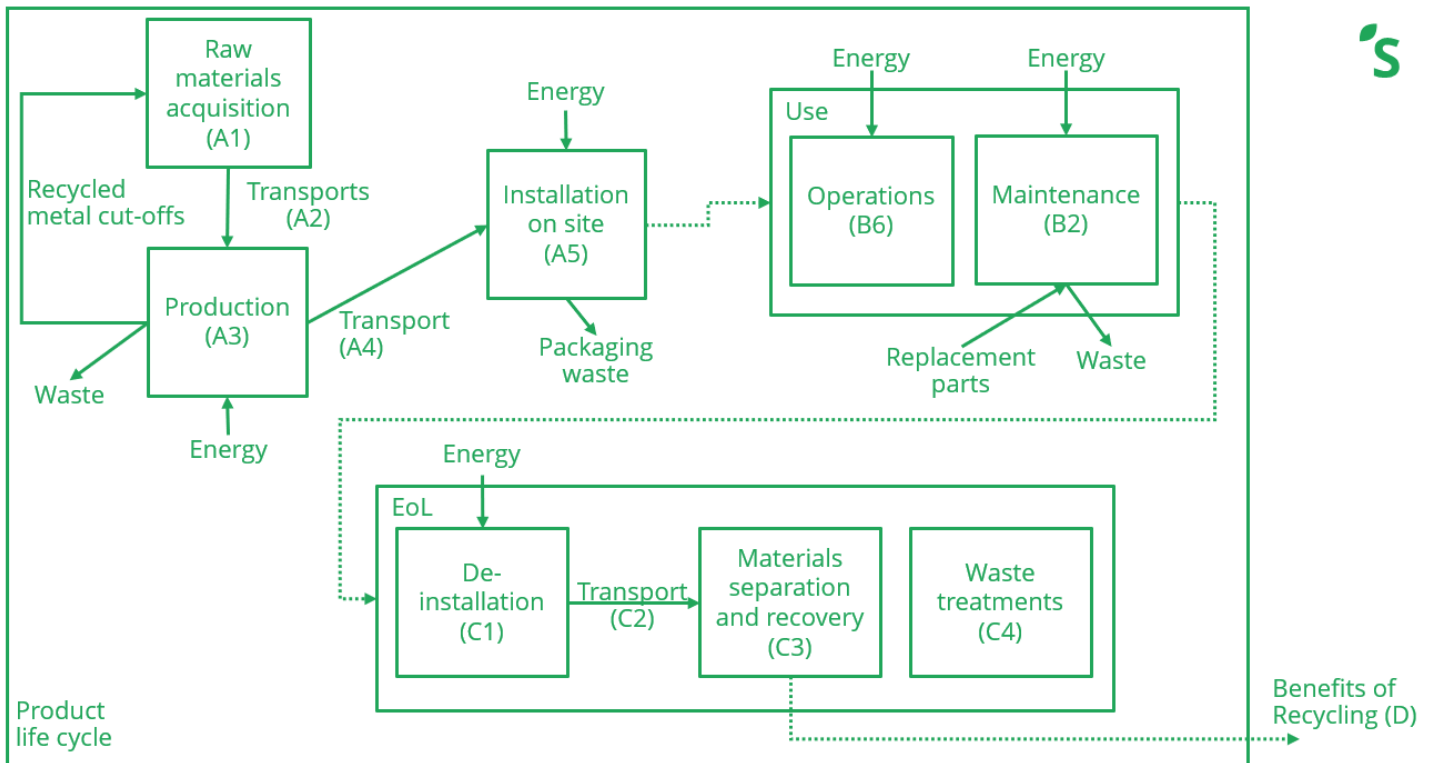
The end-of-life stage includes de-construction of the product (C1), transport to waste treatment facilities (C2), waste processing (C3), and final disposal of residues (C4).

- **Benefits and loads beyond the system boundary (D)**

Module D reports the potential benefits and loads from reuse, recovery, and recycling of materials beyond the system boundary.

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.

No materials are required during use (B1) and no water is needed for operation (B7). Repair (B3), Replacement (B4) and Refurbishment (B5) are not needed if proper maintenance is followed. These submodules are not declared as they would be zero, or are estimated to fall below the cut-off criteria.



3.3 Estimates and assumptions

Main assumptions and proxies

Cutting losses : Boon Edam manufactures doors made from both Aluminium and Glass. However, the Aluminium cutting losses for glass door are not available individually and the total Aluminium cutting losses are available as proxy. Since

Aluminium cutting losses in Aluminium doors are higher, this leads to an overestimation of Aluminium cutting losses for glass doors. However, the Aluminium cutting losses contribute less than 1% to overall emissions. Furthermore, the cutting losses are sent back to the suppliers who process the lost Aluminium and Steel and thus they do not contribute to waste disposal (C) and avoided burden (D) stages.

Survey and modelling methodology : This EPD is generated through an automated EPD tool. As a first step, users are

invited to answer a survey which contains questions about the amount of products and energy used for packaging, manufacturing, installation of the product as well as the maintenance. The answers to this questions serve as an input to a LCA model. The model results are then populated in a pre-defined EPD template which generates the EPD in PDF format.

Waste processing data assumptions : Boon Edam provides the option to its users to collect back the waste and return it back to suppliers for processing. However, in the absence of any other data, the waste scenarios for different materials were treated according to the average waste scenarios for that particular product in the Netherlands. For example, for packaging wastes, 97% of waste was assumed to be incinerated and 3% of waste was assumed to be landfilled. For some metals and alloys such as Aluminium and Steel, there are no specific datasets for incineration and landfilling. So, the environmental impacts of incineration and landfilling of these materials have been accounted for through the incineration and landfilling processes of common municipal solid waste, albeit not providing any electricity or heat recovery for this processes.

3.4 Cut-off criteria

Production stage

All materials and energy inputs and outputs were considered, based on the nomenclature of the product considered, and on the energy inputs and waste flows from the factory.

To the best of our knowledge, no input or output having a significant impact on the indicators have been left aside.

Use stage

During the use stage, the only maintenance activities not included are the cleaning and technical checks. These would consist of: energy necessary to power the cleaning devices, water, soap and transport of personnel for the technical checks. Given the predominance of the operational energy use (B6), these impacts will be negligible in comparison.

End-of-life

During the end of life stage, all the end-of-life activities have been accounted for. The end of life phase is divided into recycling, incineration and landfilling. Environmental impacts of this activities for all materials have been accounted for to the best of our knowledge and no material having significant impact has been left aside. The avoided burden from materials recycled, electricity and heat recovered has also been considered for all packaging as well as constituent materials of the CIRCLELOCK.

3.5 Background data

The EPD is generated by an EPD tool, which enables the modelling of the environmental impacts of a revolving glass door. For the application of the EPD tool, its users are required to enter the weight of different materials used in manufacture and packaging of the door through a survey, which then triggers a model run and generates the EPD. The EPD is generated from the EPD tool version 2.0 (validity: September 2025 to September 2030), owned by PRé Sustainability bv, Amersfoort, NL.

3.6 Data quality

The ecoinvent 3 database is used for every background datasets, ensuring consistence of the scope. Global market data were used for all supplies that are procured on the market without specific requirement for location, and more specific geographies were used otherwise (e.g. electricity used on-site is representative of the Dutch electricity market). All background data have been reviewed by the editor in 2020.

Primary data have been collected specifically for the product considered, at the time when the assessment has been made, and are representative of the current situation at Boon Edam. Based on the data quality framework of EN15804 provided by UN environment, the model data is assessed on three criteria of geography, time and technical accuracy. According to the framework, the data quality for Boon Edam's CIRCLELOCK is assessed as follows:

- Geographical representativeness - Good: Most of the data on production, transport and energy use is representative of the whole of Europe. So, the data is from a larger area (Europe) in which the area under study (Netherlands) is included. This satisfies the good quality data criteria of UN environment global guidance on LCA development.
- Time representativeness - Good: Most of the processes in ecoinvent 3.10 accurately reflect the data for 2020.
- Technical representativeness - Good: For Boon Edam's CIRCLELOCK, the materials used are very commonly available on the market, and thus, the processes corresponding to their production are readily available in the ecoinvent database and they represent the actual material accurately.

3.7 Period under review

Manufacturing data for the production site have been collected in 2024 and represents an average of the consumption in 2023.

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

Given the variations in size of products manufactured by Boon Edam, allocating manufacturing (A3) inputs and outputs per product was not deemed fair. As production lines within the facility were similar, allocation was done on the basis of the number of production lines.

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. Background data processes were obtained from *ecoinvent version 3.10, with the Cut-off system model, as compiled for SimaPro* in June 2023.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The biogenic carbon content quantifies the amount of biogenic carbon in a construction product leaving the factory gate, and it shall be separately declared for the product and for any accompanying packaging.

If the total mass of biogenic carbon containing materials is less than 5 % of the total mass of the product and accompanying packaging, the declaration of biogenic carbon content may be omitted. The mass of packaging containing biogenic carbon shall always be declared.

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	61.507	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO₂.

Transport to the building site (A4)

The distance is calculated as an average of Boon Edam's actual delivery, and is modelled as a freight truck transport.

Name	Value	Unit
Litres of fuel for 1t transported	4.5	l/100km
Transport distance	3500	km
Capacity utilisation (including empty runs)	49	%

Installation into the building (A5)

Name	Value	Unit
Wood	145	kg
Cardboard box	2	kg
LDPE Sheet	1	kg
Paper	0.22	kg

Maintenance (B2)

A yearly maintenance check is recommended. Motors and moving parts are prone to wear, and are replaced every few years, over the 20 years of the product.

Name	Value	Unit
Electronics	11.2	kg
Rubber	3.28	kg
Motor	15.47	kg
Plastic rollers	0.2	kg

20 years.

Reference service life

Name	Value	Unit
Life Span (according to BBSR)	20	a

Operational energy use (B6) and Operational water use (B7)

The electricity consumption of the motor drive is divided in two ranges of use:

- The door or gate is in standby mode

- The door or gate is active

The electricity consumption process was modelled usingecoinvent data for low voltage electricity mix for Europe (residual mix)

The estimated operating conditions are given below.

Name	Value	Unit
Years of use (life span)	20	years
Days used per year	312	days/year
Hours in standby (on day used)	23	hours/day
Hours active (on day used)	1	hours/day
Power in standby	45	W
Power active	200	W
Electricity consumption over lifetime	7706	kWh

End of life (C1-C4)

The common practice in the European construction sector is to separately collect metals (for economic reasons) and glass (for safety reasons).

For the other materials fates are divided between, recycling, incineration and landfill, based on European data for 2020.

For the calculation below, it is assumed that aluminum, steel, stainless steel and glass are collected separately, whereas fasteners, drive parts, electrical components, rubber and nylon are not.

The percentages of each material going to recycling, incineration and landfill respectively are aggregated over the BOM to compute the amount of waste recycled, incinerated and landfilled.

Name	Value	Unit
Collected separately waste type	380	kg
Collected as mixed construction waste construction waste	71	kg
Recycling	421	kg
Waste incineration	20	kg
Landfilling	10	kg

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

Name	Value	Unit
Glass recycled	221	kg
Aluminium recycled	104	kg
Steel recycled	11	kg
Heat generated	239	MJ
Electricity generated	122	MJ

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 CIRCLELOCK

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq	4.55E+03	7.27E+01	1.6E+01	1.1E+03	2.51E+03	1.96E+00	3.87E+00	7.41E+01	1.69E+00	-1.47E+03
GWP-fossil	kg CO ₂ eq	4.53E+03	7.27E+01	1.51E+01	1.09E+03	2.5E+03	1.95E+00	3.87E+00	7.41E+01	1.69E+00	-1.47E+03
GWP-biogenic	kg CO ₂ eq	9.47E+00	1.18E-02	8.89E-01	1.43E+00	5.62E+00	4.38E-03	6.29E-04	9.69E-04	7.51E-05	-1.83E+00
GWP-luluc	kg CO ₂ eq	8.17E+00	2.4E-02	9.54E-03	1.65E+00	7.72E+00	6.01E-03	1.28E-03	2.65E-04	3.69E-05	-3.98E+00
ODP	kg CFC11 eq	8.15E-05	1.45E-06	2.52E-07	3.75E-05	4.32E-05	3.37E-08	7.71E-08	2.35E-08	6.16E-09	-1.08E-05
AP	mol H ⁺ eq	2.85E+01	2.88E-01	5.86E-02	1.04E+01	1.27E+01	9.9E-03	1.53E-02	1.57E-02	1.27E-03	-9.24E+00
EP-freshwater	kg P eq	1.82E+00	4.8E-03	2.74E-03	1.28E+00	2.22E+00	1.73E-03	2.56E-04	1.75E-04	1.25E-05	-4.31E-01
EP-marine	kg N eq	6.05E+00	1.09E-01	2.66E-02	2.82E+00	2.21E+00	1.72E-03	5.78E-03	9.36E-03	3.84E-02	-1.55E+00
EP-terrestrial	mol N eq	5.43E+01	1.18E+00	2.23E-01	1.65E+01	1.92E+01	1.49E-02	6.3E-02	7.91E-02	5.61E-03	-1.63E+01
POCP	kg NMVOC eq	1.66E+01	4.39E-01	7.82E-02	5.04E+00	6.35E+00	4.94E-03	2.33E-02	1.98E-02	2.53E-03	-5.05E+00
ADPE	kg Sb eq	2.53E+04	8.4E+01	4.62E+01	7.75E+03	4.25E+04	3.31E+01	4.47E+00	1.95E+00	2.98E-01	-1.02E+04
ADPF	MJ	2.17E-01	2.25E-04	3.7E-05	2.84E-01	5.1E-03	3.97E-06	1.2E-05	2.7E-06	3.55E-07	5.33E-03
WDP	m ³ world eq deprived	1.74E+03	6.02E+00	-2.29E-01	4.42E+02	2.11E+03	1.64E+00	3.2E-01	3.63E+00	-3.54E+00	-3.61E+02

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 CIRCLELOCK

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
PERE	MJ	9E+03	1.74E+01	1.35E+01	1.67E+03	1.38E+04	1.07E+01	9.24E-01	6.89E-01	1.33E-01	-1.74E+03
PERM	MJ	2.79E+03	0	0	0	0	0	0	0	0	0
PERT	MJ	1.18E+04	1.74E+01	1.35E+01	1.67E+03	1.38E+04	1.07E+01	9.24E-01	6.89E-01	1.33E-01	-1.74E+03
PENRE	MJ	2.39E+04	8.39E+01	8.91E+01	7.74E+03	4.25E+04	3.31E+01	4.47E+00	1.28E+03	2.97E-01	-1.02E+04
PENRM	MJ	1.32E+03	0	-4.29E+01	0	0	0	0	-1.27E+03	0	0
PENRT	MJ	2.52E+04	8.39E+01	4.62E+01	7.74E+03	4.25E+04	3.31E+01	4.47E+00	1.95E+00	2.97E-01	-1.02E+04
SM	kg	4.94E+01	0	0	0	0	0	0	0	0	0
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	4.05E+01	1.39E-01	-5.54E-03	1.03E+01	4.91E+01	3.82E-02	7.39E-03	8.44E-02	-8.25E-02	-8.45E+00

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 CIRCLELOCK

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
HWD	kg	4.61E-01	6.89E-03	1.18E-03	1.51E-01	8.73E-02	6.8E-05	3.67E-04	2.99E-04	2.9E-05	7.11E-01
NHWD	kg	1.83E+02	4.86E+01	2.33E+01	8.55E+01	1.21E+02	9.41E-02	2.59E+00	3.75E-01	1.84E+01	-3.46E+01
RWD	kg	7.77E-02	3.26E-04	3.79E-04	6.82E-02	4.23E-01	3.3E-04	1.74E-05	1.04E-05	1.68E-06	-1.51E-02
CRU	kg	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	8.7E+01	0	0	0	0	3.84E+02	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	5.92E+01	2.07E+01	0	0	0	1.22E+02	0	0
EET	MJ	0	0	1.24E+02	4.05E+01	0	0	0	2.39E+02	0	0

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

1 CIRCLELOCK

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
PM	Disease incidence	2.88E-04	4.78E-06	8.04E-07	6.81E-05	4.09E-05	3.18E-08	2.54E-07	6.63E-08	2.9E-08	-1.09E-04
IR	kBq U235 eq	2.32E+02	1.31E+00	1.48E+00	1.28E+02	1.65E+03	1.28E+00	6.99E-02	4.04E-02	7.19E-03	-5.96E+01
ETP-fw	CTUe	2.96E+04	2.09E+02	3.97E+01	3E+04	3.67E+03	2.86E+00	1.11E+01	1.49E+02	4.88E+00	-3.4E+03
HTP-c	CTUh	1.87E-05	5.06E-07	8.67E-08	1.01E-05	4.83E-06	3.76E-09	2.69E-08	1.09E-08	1.1E-09	-3.6E-06
HTP-nc	CTUh	1.28E-05	1.12E-07	1.97E-08	1.5E-05	1.56E-06	1.22E-09	5.95E-09	1.09E-08	1.83E-10	8.48E-07
SQP	SQP	4.58E+04	6.33E+02	1.09E+02	9.05E+03	1.05E+04	8.2E+00	3.37E+01	2.93E+00	1.08E+01	-3.3E+03

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.

This EPD was created using a software tool.

6. LCA: Interpretation

Across all impact categories, the use phase (B6 – operational energy use) represents the dominant contributor to the total environmental impact of the Circlelock system. This is mainly driven by the electricity consumption of the automated doors over their 20-year lifetime. The manufacturing phase (A1–A3) also plays a significant role, largely due to the production of aluminum and glass components, which together account for the majority of material-related emissions.

End-of-life processes contribute only marginally to the total footprint, as most metals and glass are recycled, providing credits in module D for material recovery. The transport and installation phases have comparatively minor impacts. Overall, the analysis indicates that energy efficiency during operation and material selection at design stage are the most effective levers for reducing the environmental footprint of the product.

7. Requisite evidence

Not applicable for this product. It relies on electric energy for functioning and no emissions will be released in normal

conditions.

8. References

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EN 16005

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Part 2-103: Particular requirements for drives for gates, doors and windows**EN ISO 13849**

EN ISO 13849-1:2023: Safety of machinery - Safety related parts of control systems - Part 1: General principles for design

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EN 55011

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EN 61000

EN-IEC 61000-3-2:2019+A1:2021 - Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current <= 16A per phase)

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changes, voltage fluctuations and flicker in public low voltage supply systems, for equipment with rated current <=16A per phase and not subject to conditional connection

EN-IEC 61000-6-1:2019 - Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity standard for residential, commercial and light-industrial environments

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EN ISO 10077

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EN ISO 717-1

ISO 717-1:2021 - Acoustics -- Rating of sound insulation in buildings and of building elements -- Part 1: Airborne sound insulation

EN 12211

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EN 1991

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BBSR

Bundesinstitut für Bau-, Stadt- und Raumforschung

www.bbsr.bund.de

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Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products.

Also referred to as Biocidal Products Regulation or BPR



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

PRé Sustainability
Stationsplein 121
3818LE Amersfoort
Netherlands

+31 (0)33 4504010
consultancy@pre-
sustainability.com
www.pre-sustainability.com



Owner of the Declaration

Royal Boon Edam International B.V.
Ambachtstraat 4
1135GG Edam
Netherlands

+31 (0)299 38 08 08
danielle.bakker@boonedam.com
www.boonedam.com