ENVIRONMENTAL PRODUCT DECLARATION

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

Preliminary – EPD still in verification

Owner of the Declaration	ARGE
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ARG-20160154-IBG1-EN
Issue date	EPD in verification, issuance expected for July 2023
Valid to	

Locks

ARGE

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

1. General Information

ARGE

Programme holder

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

Declaration number

EPD-ARG-20160154-IBG1-EN

This declaration is based on the product category rules:

Building Hardware products, 01.01.0001
(PCR checked and approved by the SVR)

Issue date

EPD in verification, issuance expected for July 2023

Valid to

EPD in verification

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

EPD in verification

Dipl.-Ing. Hans Peters
(Managing Director Institut Bauen und Umwelt e.V.)

Locks

Owner of the declaration

ARGE – The European Federation of Locks and Building Hardware Manufacturers
Offerstraße 12
42551 Velbert
Germany

Declared product / declared unit

1 kg of locks

Scope:

This ARGE EPD covers locks used to secure doors, windows or shutters in buildings. The reference product used to calculate the impact this product group has on the environment is a high security night latch composed primarily of steel, zinc-based alloy and brass, and has been selected for the LCA (Life Cycle Assessment) because it is the product with the highest impact for 1 kg of product. A validity scope analysis has also been carried out to determine the limiting factors for locks covered by this EPD. In a preliminary study (simplified LCA), it has been confirmed that this EPD represents the worst-case condition and it can therefore be used to cover all locks manufactured in Europe by ARGE member companies.
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

EPD in verification

Name of verifier ,
(Independent verifier)

2. Product

2.1 Product description/Product definition

This EPD refers to mechanical locks, latches and security devices to be used in buildings. The sample group used to calculate the LCA data for this ARGE EPD includes sash locks, multipoint locks and night latches. For specific products the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland)
Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration *EN 12209:2003, Building hardware – Locks and latches – Mechanically operated locks and locking plates – Requirements and test methods;* and the CE-marking.

2.2 For the use and application of products for which *Regulation (EU) No. 305/2011 (CPR)* does not apply, the respective national provisions at the place of use apply, in Germany for example the building codes of the countries and the corresponding national specifications.Application

These products are designed to be used in door, window, and shutter assemblies of varying materials and applications. Their purpose is to ensure the fastening of doors, windows or shutters in the closed position. In respect of doors, they can be used on either interior or exterior doors.

2.3 Technical Data

Ideally, products should comply with a suitable technical specification. /EN 12209/ and /prEN 15685/ are examples of such a specification and some products will comply with this. The relevant grading structure according to EN 12209 is shown in the following table:

Locks according to the classification in EN 12209

Name	Value	Unit
Category of use	1 - 3	Grade
Durability	A,B,C,L,M,R,S,W,X	Grade
Door mass and closing force	0 - 9	Grade
Suitability for use in fire resisting and/or smoke control door sets	0,A,B,N	Grade
Safety	0	Grade
Corrosion resistance	0,A,C,D,F,G	Grade
Security - burglar resistance	0 - 7	Grade
Key identification of lever locks	0,A,B,C,D,E,F,G,H	Grade

The quoted standard defines the requirements of the product and the associated test methods. As construction hardware products are part of a set of a construction products (doorset, shutter, window), European application standards for locks themselves do not exist.

If applicable, performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 12209:2003, Building hardware Locks and Latches - Mechanically operated locks. latches and locking plates - Requirements and test methods.*

2.4 Delivery status

The products are sold by unit. Deliveries of a single unit might be possible but will be an exception. Regular deliveries will cover a larger amount of locks as they are put on the market as "B2B" product and not for an end-user.

2.5 Base materials/Ancillary materials

Composition of product analysed for this EPD:

The values given are for the product analysed for this EPD.

Name	Value	Unit
Zinc-based alloy (0% - 63,73%)	64	%
Steel (20,96% - 91,25%)	21	%
Brass (3,31% - 9,21%)	9	%
Nickel Silver (0% - 5,49%)	6	%

Ranges of values for other products covered by the validity scope analysis are shown in brackets.

Zinc-based alloy is an alloy of four separate metals: zinc, aluminium, magnesium and copper. Zinc-based alloy lock components are made by pressure diecasting

Steel is produced by combining iron with carbon as well as other elements depending on the desired characteristics. Steel lock components are made by punch pressing and/or cold forming.

Brass is an alloy of zinc and copper. Brass lock components are made by punch pressing, cold forming, hot stamping and/or machining.

Nickel silver is an alloy of copper (~60%) with nickel (~20%) and zinc (~20%). Nickel silver components are made by punch pressing and/or machining.

1) This product/article/at least one partial article contains substances listed in the *ECHA candidate list* (date: 17.01.2023) exceeding 0.1 percentage by mass: Certain components may contain small amounts of lead (CAS no. 7439-92-1) as an alloying element.

2) This product/article/at least one partial article contains other ancerogen mutagen reprotoxic (CMR) substances in categories 1A or 1B which are not on the *ECHA candidate list*, exceeding
0.1 percentage by mass: 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

The production of a lock normally follows a 3-step procedure:

1. Prefabrication of semi-finished components This step might include a surface treatment on factory site or by external contractors.
2. Preassembly of modules, if feasible (onsite factory)
3. Final assembly (onsite factory)

2.7 Environment and health during manufacturing

Regular measurements of air quality and noise levels are performed by ARGE member manufacturers. Resulting levels shall be within compulsory safety limits. In areas where
employees are exposed to chemical products, prescribed safety clothes and technical safety devices shall be provided. Regular health checks are mandatory for employees of production sites.

2.8 Product processing/Installation

The installation of the product could vary depending on the type of door, window and shutter and the specific situation but products shall not require energy consumption for installation.

2.9 Packaging

Normally each single product is packaged in a cardboard box. Bigger amounts of 12 to 50 locks are then packed in bigger cardboard boxes or other type of bulk packaging and then stacked on wooden pallets for transport to the customer. Waste from product packaging is collected separately for waste disposal (including recycling).

2.10 Condition of use

Once installed, the products shall require no servicing during their expected service lives. There shall be no consumption of water or energy linked to their use, and they shall not cause any emissions.

2.11 Environment and health during use

No environmental damage or health risks are to be expected during normal conditions of use.

2.12 Reference service life

The Reference Service Life is 30 years under normal working conditions. This corresponds to passing a mechanical endurance test of 100.000 cycles as specified in *EN 12209*. The Reference Service Life is dependent on the actual frequency of use and environmental conditions.

It is required that installation as well as maintenance of the product are done in line with instructions provided by the manufacturer.

2.13 Extraordinary effects

Fire

The product is suitable for use on fire resisting and/or smoke control doorsets according to one of the classes 0,A,B,N. in *EN 12209:2016*.

Water

The declared product is intended to be used in a building under normal conditions (indoor and outdoor use). It shall not emit hazardous substances in the event of flooding.

Mechanical destruction

Mechanical destruction of the declared product shall not materially alter its composition or have any adverse effect on the environment.

2.14 Re-use phase

Removal of locks (for re-use or re-cycling) shall have no adverse effect on the environment.

2.15 Disposal

Locks should be re-cycled wherever possible, providing that there is no adverse effect on the environment. The waste code in accordance with the *European Waste Code* is 17 04 07.

2.16 Further information

Details of all types and variants to be shown on the manufacturers' websites listed on https://arge.org/members

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit for all products covered by ARGE EPD is 1 kg (of product). Since individual products will rarely weigh exactly 1 kg it is necessary to establish the exact weight of the product then use this as a correction factor to determine the true values for 1 kg of product in the tables (Section 5).

A total of 9 typical products (based on sales figures) have been evaluated, and the worst-case results are used in the tables.

Declared unit

Name	Value	Unit
Declared unit	1	kg
Mass of declared Product	1.64	kg

3.2 System boundary

Type of the EPD: "cradle to gate with options, with modules C1 – C4, and module D (A1-A3, C1-C3, D and additional modules)"

The analysis of the product life cycle includes the production and transport of the raw materials, manufacture of the product and the packaging materials which are declared in modules A1-A3.

Losses during production are considered as waste and are sent for recycling. No recycling processes are taken into account except transport and electricity consumption for grinding the metals. When recycled metals are used as raw material only their transformation process is taken into account and not the extraction of the raw material.

A4 module represents the transport of the finished locks to the installation site.

There is no waste associated with the installation of the product. The A5 module therefore represents only the disposal of the product packaging.

The End-of-Life (EoL) stages are also considered. The transportation to the EoL disposal site is taken into account in module C2. Module C4 covers the disposal of the locks. Module C3 covers the recycling of the individual elements according to European averages, with the remaining waste divided between incineration and landfill. Such a mixed scenario is declared due to the complex material mix of the product and the dependency of the EoL-route on the EoL route of the product the lock has been integrated into.
In practice, the end of life has been modelled as follows:

- when a material is sent for recycling, generic transport and electric consumption of a shredder is taken into account (corresponding to the process 'Grinding, metals'). Only then, is the material considered to have attained the 'end of waste' state.
- each type of waste is modelled as a transport to the treatment site with a distance of 30 km. Parts sent for recycling include an electricity consumption (grinding) and a flow ('Materials for recycling, unspecified').

3.3 Estimates and assumptions

The LCA data of the declared lock has been calculated using the production data of 9 ARGE member companies. These companies have been chosen by ARGE as being representative of their production processes and their market shares. The lock chosen as representative for this calculation follows the "worst case" principle as explained under 6. LCA interpretation.

3.4 Cut-off criteria

The cut-off criteria considered are 1% of renewable and non-renewable primary energy usage and 1% of the total mass of that unit process. The total neglected input flows per module amount to a maximum of 5% of energy usage and mass.

For this study, all input and output flows have been considered at 100%, including raw materials as per the product composition provided by the manufacturer and packaging of raw materials as well as the final product. Energy and water consumptions have also been considered at 100% according to the data provided.

With the approach chosen, no significant environmental impacts are known to have been cut-off.

3.5 Background data

For life cycle modelling of the considered product, all relevant background datasets are taken from *ecoinvent 3.8* (system model: cut-off by classification).

3.6 Data quality

The objective of this evaluation is to evaluate the environmental impacts generated by the products throughout their entire life cycles. To this end, *ISO 14040*, *ISO 14044* and *EN 15804* have been met regarding the quality of data on the following different criteria:

The time factor, the life cycle inventory data used comes from:

Data collected specifically for this study on the ARGE manufacturers' sites. Datasets are based on 1-year averaged data (time period: January 2013 to December 2013 considered representative for 2021.

In the absence of collected data, generic data from the *ecoinvent v.3.8* database has been used. This is updated regularly and is representative of current processes (the entire database having been updated in 2021).

Geography: Data comes from production sites of the ARGE manufacturers. Generic data comes from the ecoinvent database, representative of European production processes.

Technology: material shaping technologies are based on European technology in the case of use of generic data.

3.7 Period under review

The data of the LCA is based on the annual production data of an ARGE member from 2013, considered also representative for the year 2021.

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

The products are produced in numerous production sites. All data was provided by the manufacturers of the products per unit, and then divided by the mass of the product to give a value per kg of product produced.

The assumptions relating to the EoL of the product and waste during its life cycle are described in the section System Boundaries. Metal losses during production (stage A3) are considered as waste.

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.
The used background database has to be mentioned.

4. LCA: Scenarios and additional technical information

Characteristic product properties biogenic carbon

Information on biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	0	kg C
Biogenic carbon content in accompanying packaging	0,055	kg C

The following
information is the basis of the declared modules within the LCA in this EPD.

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel	25.8	l/100km
Transport distance	3500	km
Capacity utilisation (including empty runs)	36	%

Installation into the building (A5)

Name	Value	Unit
Material loss	-	kg
Output substances following waste treatment on site	0.135	kg

In case a **reference service life** according to applicable ISO standards is declared then the assumptions and in-use conditions underlying the determined RSL shall be declared. In addition, it shall be stated that the RSL applies to the reference conditions only.

The same holds for a service life declared by the manufacturer. Corresponding information related to in-use conditions needs not be provided if a service life taken from the list of service life by *BNB* is declared.

Reference service life

Name	Value	Unit
Reference service life	30	a
Test cycles over RSL (EN 12209)	100'000	cycles

End of life (C1-C4)

Name	Value	Unit
Collected separately	1	kg
Recycling	0.281	kg
Energy recovery	0.331	kg
Landfilling	0.388	kg

It is assumed that a 16-32 ton truck is used to transport the product:
- Transport to shredding facility for metal recovery: 150 km
- Transport to municipal waste incineration plant: 50 km

- Transport to landfill: 30 km

Reuse, recovery and/or recycling potentials (D), relevant scenario information
Module D contains the benefits and loads beyond the system boundary related to the recycling of metals, which result from the treatment of recycled materials from the point of end-of-waste status to the point of substitution (as costs) and the substitution of primary resources (as benefits).

According to *EN 16710*, clause 6.4.3.3: 'In module D substitution effects are calculated only for the resulting net output flow.

For building hardware, the following rules apply for the quantification of net output flows:
- all production scrap and cuttings leave modules A1-B3 as sorted scrap without allocated burdens from primary production; the corresponding amounts are declared as material for recycling (MFR);
- net amounts of a metal leaving the product system are quantified as the material for recycling leaving modules A1-C4 minus the input of secondary scrap (secondary material, SM) to the product system;
- in the case of brass and zinc alloys, which are composed of two different constituting metals, no difference shall be made between the input of secondary constituting metals (Cu and Zn; Cu and Sn) and its alloys (CuZn; CuSn)."

Negative net output flows have been considered in the quantification of module D.

It also includes the benefits and loads related to 'exported energy electricity' and 'exported energy heat' resulting from the energy recovery from plastic wastes
in a MWIP as modelled in Modules A3, A5 and C4.

5. LCA: Results Please note – EPD in verification

In Table 1 "Description of the system boundary", the declared modules are indicated with an "X"; all modules that are not declared within the EPD but where additional data is available are indicated with "MND". This data can also be used for building assessment scenarios. The values are declared with three valid digits in exponential form.

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

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg of locks

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	5.62E+00	6.47E-01	-1.26E-01	0	1.51E-02	3.16E-03	1.1E-02	-2.05E+00
GWP-fossil	kg CO_2 eq	5.81E+00	6.47E-01	7.77E-02	0	1.51E-02	3.15E-03	1.1E-02	-2.05E+00
GWP-biogenic	kg CO_2 eq	-2.03E-01	0	-2.03E-01	0	0	0	0	0
GWP-luluc	kg CO_2 eq	1.48E-02	2.59E-04	1.16E-06	0	6.02E-06	7.85E-06	3.49E-06	-5.57E-03
ODP	kg CFC11 eq	3.55E-07	1.5E-07	5.28E-10	0	3.49E-09	1.6E-10	1.21E-09	-8.84E-08
AP	mol H^+ eq	1.32E-01	1.84E-03	3.13E-05	0	4.28E-05	1.62E-05	3.12E-05	-5.22E-02
EP-freshwater	kg P eq	6.38E-04	4.61E-06	4.43E-08	0	1.07E-07	3.54E-07	6.72E-08	-1.94E-04
EP-marine	kg N eq	9.62E-03	3.65E-04	1.31E-05	0	8.5E-06	2.08E-06	1.09E-05	-2.93E-03
EP-terrestrial	mol N eq	1.17E-01	4.07E-03	1.42E-04	0	9.47E-05	2.4E-05	1.16E-04	-3.61E-02
POCP	kg NMVOC eq	3.46E-02	1.56E-03	3.57E-05	0	3.64E-05	6.57E-06	3.52E-05	-1.15E-02
ADPE	kg Sb eq	2.62E-03	2.29E-06	1.15E-08	0	5.34E-08	7.63E-09	1.39E-08	-1.21E-03
ADPF	MJ	6.67E+01	9.81E+00	3.91E-02	0	2.28E-01	6.67E-02	8.87E-02	-2.23E+01
WDP	m^3 world eq deprived	3.14E+00	2.99E-02	1.18E-03	0	6.95E-04	7.45E-04	-9.63E-04	-8.43E-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 kg of locks

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1.15E+01	1.38E-01	-1.76E+00	0	3.21E-03	1.27E-02	1.4E-03	-3.06E+00
PERM	MJ	2.54E+00	0	1.76E+00	0	0	0	0	0
PERT	MJ	1.4E+01	1.38E-01	1.14E-03	0	3.21E-03	1.27E-02	1.4E-03	-3.06E+00
PENRE	MJ	6.67E+01	9.81E+00	9.99E-01	0	2.28E-01	6.73E-02	1.71E-01	-2.23E+01
PENRM	MJ	1.62E-01	0	-9.6E-01	0	0	0	-8.21E-02	0
PENRT	MJ	6.68E+01	9.81E+00	3.91E-02	0	2.28E-01	6.73E-02	8.87E-02	-2.23E+01
SM	kg	1.08E-01	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m^3	0	0	0	0	0	0	0	0

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 kg of locks

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	4.69E-04	2.56E-05	3.25E-07	0	5.96E-07	2.37E-08	1.71E-07	-1.58E-04
NHWD	kg	1.99E+00	5.16E-01	5.42E-03	0	1.2E-02	2.51E-04	3.8E-01	-3.72E-01
RWD	kg	3.67E-04	1.42E-04	3.57E-07	0	3.3E-06	8.97E-07	1.14E-06	-8.16E-05
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	1.11E-01	0	0	0	0	4.71E-01	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	6.97E-04	0	1.02E-01	0	0	0	3.48E-03	0

EET	MJ	4.62E-03	0	6.77E-01	0	0	0	2.3E-02	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 kg of locks

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	5.57E-07	5.2E-08	3.23E-10	0	1.21E-09	4.33E-11	9.37E-10	-1.76E-07
IR	kBq U235 eq	1.96E-01	4.26E-02	1.19E-04	0	9.91E-04	6.07E-04	3.41E-04	-4.85E-02
ETP-fw	CTUe	9.36E+02	7.7E+00	1.58E-01	0	1.79E-01	3.36E-02	2.12E-01	-3.15E+02
HTP-c	CTUh	3.53E-08	2.48E-10	5.37E-12	0	5.76E-12	8.97E-13	9.85E-12	-1.12E-08
HTP-nc	CTUh	1.7E-06	7.78E-09	2.57E-10	0	1.81E-10	2.91E-11	9.49E-11	-6.54E-07
SQP	SQP	7.05E+01	6.84E+00	1.9E-02	0	1.59E-01	1.03E-02	1.51E-01	-1.66E+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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators "abiotic depletion potential for non-fossil resources", "abiotic depletion potential for fossil resources", "water (user) deprivation potential, deprivation-weighted water consumption", "potential comparative toxic unit for ecosystems", "potential comparative toxic unit for humans – cancerogenic", "Potential comparative toxic unit for humans - not cancerogenic", "potential soil quality index". The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

6. LCA: Interpretation

The following figure illustrates the relative contributions of the different modules along the life cycle of the declared products:

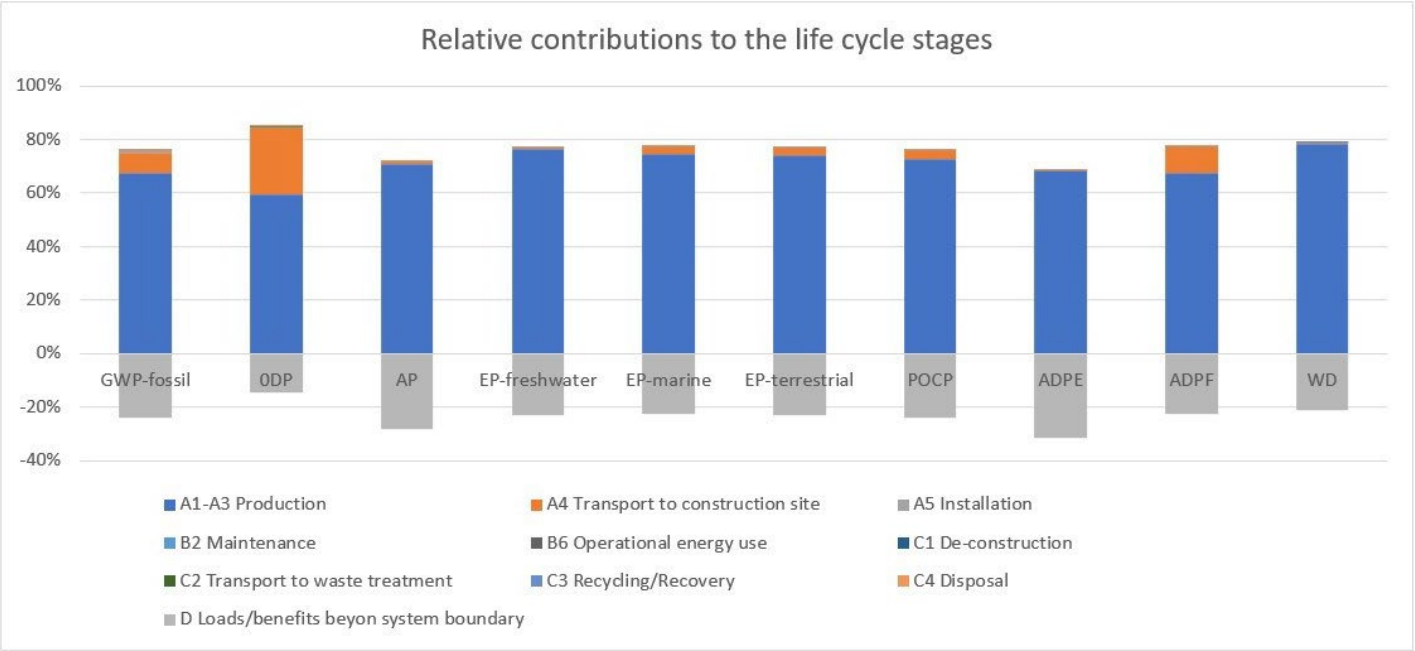

Figure 1: Environmental impacts of locks (L) along its life cycle (impacts from production modules A1-A3 = 100 %)

The largest part of environmental impacts is caused during production (modules A1-A3); comparably small impacts are caused during the transport of the product to the construction site (via the manufacturer of the product, which the lock has been integrated into).

All the other modules related to the product life cycle are not significant

Benefits and burdens beyond the system boundary (module D) are in the order of 15 % to 30 % of the impacts over the product life cycle (modules A1-A3) and relate basically to the recycling of metals.

7. Requisite evidence

No testing results are required by the PCR part B.

8. References

Product category rules of IBU

IBU (2021)
IBU (2021): General Instructions for the EPD Programme of the Institut Bauen & Umwelt e.V. (General Instructions for the IBU EPD Programme). Version 2.0, Institut Bauen & Umwelt, Berlin.

IBU (2021)
IBU (2021): PCR Part A: Calculation rules for the life cycle assessment and requirements on the project report according to EN 15804+A2. Version 2.1., Institut Bauen & Umwelt, Berlin.

IBU (2017)
IBU (2020): PCR Part B: Requirements on the for building hardware. Version 2017/011, Institut Bauen & Umwelt, Berlin.

Standards and legal documents

EN 15804
EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works -
Environmental product declarations - Core rules for the product category
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EN 17610
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