ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	**ASSA ABLOY Sicherheitstechnik GmbH**
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ASA-20130279-IBC1-EN
Issue date	21.02.2014
Valid to	20.02.2019

Self-Locking-Panic-Lock by Latch, Clutch Control

ASSA ABLOY Sicherheitstechnik GmbH
An ASSA ABLOY Group company

Institut Bauen
und Umwelt e.V.

www.bau-umwelt.com / https://epd-online.com

ASSA ABLOY

1. General Information

ASSA ABLOY

Self-Lock-Panic (SLP) by latch, clutch control N1582 series

Programme holder
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Germany

Owner of the Declaration
ASSA Abloy Sicherheitstechnik
Bildstockstrasse 20
72458 Albstadt
Germany

Declaration number
EPD-ASA-20130279-IBC1-EN

Declared product / Declared unit
The declaration represents 1 SLP lock by latch, electromechanic clutch control for a backset of 35mm

This Declaration is based on the Product Category Rules:
Locks and fittings , 07-2012
(PCR tested and approved by the independent expert committee)

Scope:
EPDs are based on the full lifecycle of SLP N1582. Data collected from lock case manufacturer in Apeldoorn/NL. 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.

Issue date
21.02.2014

Valid to
20.02.2019

Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)

Dr. Burkhart Lehmann
(Managing Director IBU)

Verification

The CEN Norm EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025
☐ internally ☒ externally

Dr.-Ing. Wolfram Trinius
(Independent tester appointed by SVA)

2. Product

2.1 Product description

The SLP lock by latch, electromechanic clutch control N1582 are automatic, handle controlled, latch bolt locks designed for single or double leaf door. Double leaf doors are equipped with corresponding passive leaf locks. The secure locking element is always activated, by a 20mm projection, as the door is closed. The lock is designed for doors in escape routes. The electrical control mechanism engages the outside handle to the lock mechanism. The locks are designed to be installed inside the door frame, e.g. mortise lock. All lock status data is transferred by a two wire bus system to control system, other door components and building controls.
Control actors are bistable, with no power consumption in locked or unlocked mode.

SLP lock by latch, clutch control N1582 combines with the two wire bus a control system to communicate with electronic access control system hardware, and other door components, to reduce the number of electronic control boxes in a door installation.

2.2 Application

SLP lock by latch, electromechanic clutch control N1582 is designed for single or double leaf doors and is typically installed in tubular frame doors in steel, aluminum and plastic - commercial project doors, fire doors, special doors, multi-functional doors, controlled security doors in office buildings, hospitals, hotels, shopping centres, public buildings, industrial buildings etc.

2.3 Technical Data

The product has the following technical properties:

Name	Value	Unit
Dimensions (W*H*D or W*H*L)	LxBxH: 370 mm x 185 mm x 20 mm	inch / cm
Weight	0,506 Kg	oz / g
Supply voltage	12-24VAC/DC +/- 15%	VDC
Power consumption (Stand-by)	Standby 80mA	W
Power consumption (Idle)	0 mA	W
Power consumption (Peak)	Peak 170mA (0,3 sec)	W
Temperature (Operating)	-40°C to +70°C	deg F / deg C
Temperature (Storage)	5°C to 40°C	deg F / deg C

2.4 Placing on the market / Application rules

For the marketing in the EU/EFTA the Regulation (EU) No 305/2011(CPR), dated from 9 March 2011 applies. The products need a Declaration of Performance taking into consideration EN 12209:2003/AC:2005- Building hardware - Locks and latches - Mechanically operated locks, latches and locking plates - Requirements and test methods and the CE-marking. For the application and use the respective national provisions apply.
The products are related to further European standards:

- /EN 179/ (in combination with related Advancing Healthy Workplaces (AHW))
- /EN 1125/ (in combination with related Panic Exit Devices (PEDs))

2.5 Delivery status

Delivered as separate lock case in a box size - 380 mm x 185 mm x 26 mm.

2.6 Base materials / Ancillary materials

The composition of the SLP lock in percentage (%) of total mass per unit (excluding packaging) is, as follows:

Component	Percentage in mass (%)
Steel	62
Zinc	4
Stainless steel	23
Electronics	9
Plastics	2
Others	1
Total	**100**

2.7 Manufacture

Products are provided by tier-1 supplier in Romania which is /ISO 9001/, /ISO 14001/ and /ISO 18001/ certified. The electronics are produced in China and the mechanics in Romania. The components come from processes like stamped steel, turning, zinc and steel casting. Final assembly takes place in Sweden.

2.8 Environment and health during manufacturing

ASSA ABLOY is committed to producing and distributing door opening solutions with minimal environmental impact, where health & safety is the primary focus for all employees and associates
• Routinely monitoring our environmental operations, green house gases (GHG), energy, water, waste, volatile organic compounds (VOC), surface treatment and health & safety (H&S). Conduct periodic inspections, audits, and reviews to ensure that we meet applicable standards and to evaluate our Environment Management program effectiveness
• Code of Conduct covers human rights, labor practices and decent work. Personnel are aware of their environmental roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance. The production site meets /OHSAS 18001/ and /ISO 14001/
• Employees' safety is assured by implementing dust and ventilation extract systems for applicable processes. Waste metals are collected and separated for recycling

2.9 Product processing/Installation

SLP lock by latch clutch control N1582 is distributed through and installed by trained installation technicians, such as locksmiths or security technicians. Door and frame preparations are made at manufacturer's production sites.

2.10 Packaging

SLP lock is packed in a cardboard box with corrugated carton inlays. The packaging is fully recyclable. Separate lock case package with dimensions: 380 mm x 185 mm x 26 mm.

2.11 Condition of use

To maintain low friction and secure latching, annual maintenance <1g of grease on contact surfaces of latch bolt is recommended.
No cleaning. Locks can be replaced or upgraded without changing control unit or installation cable.

2.12 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 installation and use of the product.

2.13 Reference service life

Approved for 1.000.000 cycles under normal working conditions, 10 years depending on cycle frequency.

2.14 Extraordinary effects

Fire
Suitable for use in fire and smoke doors (/EN 14846/).

Water
Contain no substances that have any impact on water in case of flood. Electric operation of the device will be influenced negatively.

Mechanical destruction
No impact on human health and environment is known or expected. Especially no hazardous substance can be anticipated in case of a mechanical destruction.

2.15 Re-use phase

It is possible to re-use the product during the reference service life and it can and be moved to from one door to another.

The major materials and parts, by weight, are steel, zinc, and stainless steel, which can all be recycled. The locks can be mechanically dissembled to separate the different materials. 90% of the materials used are recyclable. The plastic components can be used for energy recovery in an incineration plant.

2.16 Disposal

Waste codes according to European Waste Catalogue and Hazardous Waste List - Valid from 1 January 2002.

Manufacturing:
/EWC 12 01 01/ Ferrous metal filings and turnings

/EWC 12 01 03/ Non-ferrous metal filings and turnings.

Packaging:
All materials incurred during Installation on their end-of-life are directed to a recycling unit.
/EWC 15 01 01/ paper and cardboard packaging
/EWC 15 01 02/ plastic packaging.

End of life:
All materials on their end-of-life can be directed to a recycling unit.
/EWC 16 02 14/ discarded Equipment other than those mentioned in 16 02 09 to 16 02 13.
/EWC 16 02 16/ components removed from discarded equipment other than those mentioned in 16 02 15.
/EWC 17 04 05/ iron and steel.

2.17 Further information

For further information contact:
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3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of Self-Locking-Panic-Lock (excluding packaging) as specified in Part B requirements on the EPD for Doors, windows, shutters, and related products/IBU PCR Part B/.

Declared unit

Name	Value	Unit
Declared unit	1	piece of Self-Locking-Panic-Lock
Mass (total system)	0.543	kg/piece
Conversion factor to 1 kg	1.84	

3.2 System boundary

Type of the EPD: cradle to gate - with Options
The following life cycle phases were considered for SLP lock:
A1-A3 Production phase:

- A1 – Raw material extraction and processing
- A2 – Transport to the manufacturer and
- A3 – Manufacturing.

A4-A5 Construction phase:

- A5 – Packaging waste processing

The use phase:

- B2 - Maintenance (lock greasing)

Use stage related to the operation of the building includes:

- B6 – Operational energy use (energy consumption for lock operation)

C1-C4 End-of-life phase:

- C2 – Transport to waste processing,
- C3 – Waste processing recycling and
- C4 – Disposal (landfill).

These information modules include provision and transport of all materials, products, as well as energy and water provisions, waste processing up to the end-of-waste status or disposal of final residues.

Module D:

- Declaration of all benefits or recycling potential from EOL and A5

3.3 Estimates and assumptions

Transport:
Real-world data on mode of transport and distances, as reported by suppliers, have been considered for those materials and parts contributing more than 2% tot the total product mass. For parts and materials, contributing less than 2% to the total product mass, transport by road over an average distance of 500km has been assumed.

Use phase:
For the use phase, it is assumed that the lock is used in the European Union, thus an European electricity grid mix is considered within this phase. The operating hours of the product are accounted for 8760 hours per year; power consumption is 1 W.

EOL:
In the End-of-Life phase a recycling scenario with 100% collection rate was assumed.

3.4 Cut-off criteria

In the assessment, all available data from production process were considered, i.e. all raw materials used, auxiliary materials (e.g. lubricants), thermal energy consumption and electric power consumption - including material and energy flows contributing less than 1% of mass or energy (if available).

For raw materials, contributing more than 2% to the total product mass, means of transportation and distances were modeled in more detail to better reflect the reality; for materials or product parts, contributing less than 2% of total product mass, average distances and traditional means of transport were assumed. Average distance assumptions were based on following thoughts:
- within one country – max. transport distance of 500 km;
- between two countries/regions – average distance between these countries/regions.
- Several supplier countries – weighted average distances.

The overall contribution derived from these assumptions does not exceed 5% to the impact categories under consideration. Impacts relating to the production of machines and facilities required during production are not within the scope of this assessment.

3.5 Background data

For life cycle modeling of the considered products, the /GaBi 6/ Software System for Life Cycle Engineering, developed by PE INTERNATIONAL AG, is used /GaBi 6 2013/. The GaBi-database contains consistent and documented datasets which are documented in the online
GaBi-documentation /GaBi 6 2013D/.
To ensure comparability of results in the LCA, the basic data of /GaBi/ database were used for energy, transportation and auxiliary materials.

3.6 Data quality

The requirements for data quality and background data correspond to the specifications of the /IBU PCR PART A/.
PE INTERNATIONAL performed a variety of tests and checks during the entire project to ensure 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 the /GaBi 6/ software database. The last revision of the used background data has taken place not longer than 10 years ago.

3.7 Period under review

The period under review is 2012/13 (12 month average).

3.8 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. Following specific life cycle inventories for the WIP are considered:

- Waste incineration of plastic from packaging
- Waste incineration of paper from packaging
- Thermal treatment of plastic parts
- Waste incineration of electronic scraps (PWB)

Regarding the recycling metal, 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 each background dataset is available in the corresponding GaBi dataset documentation.

3.9 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.

4. LCA: Scenarios and additional technical information

In the EPD scenarios and/or technical information for modules A5, B2, B6, C1-C4 and D are given.

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site Packaging (paper + plastic)	0.047	kg

Maintenance (B2)

Name	Value	Unit
Lubricants	0.001	kg/a

Reference service life

Name	Value	Unit
Reference service life	10	a

Operational energy use (B6)

Name	Value	Unit
Electricity consumption (during lifetime)	87.6	kWh

Total energy consumed during the whole product life was calculated using following formula:

(W_active_mode*h_active_mode+W_idle_mode*h_idle_mode+W_stand_by_mode*h_stand_by_mode)*Life_span*days_year*0.001

Where:
W_active_mode - Energy consumption in active mode in W
h_active_mode - Operation time in active mode in hours
W_idle_mode - Energy consumption in idle mode in W
h_idle_mode - Operation time in idle mode in hours
W_stand_by_mode - Energy consumption in stand-by mode in W
h_stand_by_mode - Operation time in stand-by mode in hours
Life_span - Reference service life of product
days_year - Operation days per year
0.001 - Conversion factor from Wh to kWh.

End of life (C1-C4)

Name	Value	Unit
Collected separately steel, stainless steel, zinc, electronic (PWB)	0.451	kg
Collected as mixed construction waste construction waste for landfilling	0.043	kg
Recycling steel, stainles steel, zinc, electronic	0.451	kg
Landfilling construction waste	0.043	kg

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

Name	Value	Unit
Collected separately waste Self-locking-panic lock by latch, clutch control N1582 series (including packaging)	0.543	kg
Recycling steel	52	%
Recycling stainless steel	21	%
Recycling zinc	3	%
Recycling/Reuse electronic (PWB)	7	%
Reuse paper packaging (from A5)	8	%
Reuse plastic packaging (from A5)	1	%
Construction waste going to landfill	8	%

5. LCA: Results

The Table below shows the LCA results for the declared unit - 1 piece of self-locking-panic lock by latch, clutch control N1582 series.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement[1)]	Refurbishment[1)]	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	MND	X	MND	X	MND	MND	MND	X	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: declared unit and product

Parameter	Unit	A1 - A3	A5	B2	B6	C2	C3	C4	D
GWP	[kg CO_2-Eq.]	6.67E+0	6.92E-2	-1.64E-2	4.22E+1	1.29E-2	6.41E-3	2.5E-3	-1.39E+0
ODP	[kg CFC11-Eq.]	9.1E-10	1.85E-12	5.11E-12	3.79E-8	2.25E-13	5.76E-12	4.65E-13	-3.5E-11
AP	[kg SO_2-Eq.]	4.64E-2	1.78E-5	1.4E-4	2.0E-1	5.84E-5	3.04E-5	3.7E-6	-1.27E-2
EP	[kg $(PO_4)^{3-}$- Eq.]	3.55E-3	2.84E-6	5.41E-5	1.05E-2	1.35E-5	1.6E-6	5.67E-7	-6.81E-4
POCP	[kg Ethen Eq.]	3.01E-3	1.76E-6	3.04E-6	1.18E-2	-1.92E-5	1.79E-6	9.61E-7	-8.35E-4
ADPE	[kg Sb Eq.]	1.07E-3	1.69E-9	2.94E-9	5.81E-6	4.8E-10	8.83E-10	2.18E-10	-6.38E-4
ADPF	[MJ]	7.92E+1	4.46E-2	1.02E-1	4.8E+2	1.78E-1	7.29E-2	8.11E-3	-1.45E+1

Caption	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

RESULTS OF THE LCA - RESOURCE USE: declared unit and product

Parameter	Unit	A1 - A3	A5	B2	B6	C2	C3	C4	D
PERE	[MJ]	6.35E+0	-	-	-	-	-	-	-
PERM	[MJ]	0.0E+0	-	-	-	-	-	-	-
PERT	[MJ]	6.35E+0	2.77E-3	3.37E-1	1.24E+2	7.0E-3	1.88E-2	6.3E-4	-4.73E-1
PENRE	[MJ]	8.57E+1	-	-	-	-	-	-	-
PENRM	[MJ]	0.0E+0	-	-	-	-	-	-	-
PENRT	[MJ]	8.57E+1	4.96E-2	1.06E-1	7.45E+2	1.79E-1	1.13E-1	8.48E-3	-1.47E+1
SM	[kg]	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	-
RSF	[MJ]	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
NRSF	[MJ]	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
FW	[m^3]	2.82E+1	2.01E-1	2.02E-1	3.33E+2	7.76E-3	5.07E-2	-1.6E-2	-3.93E+0

Caption	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 – OUTPUT FLOWS AND WASTE CATEGORIES: declared unit and product

Parameter	Unit	A1 - A3	A5	B2	B6	C2	C3	C4	D
HWD	[kg]	1.4E-2	1.17E-3	4.56E-6	0.0E+0	0.0E+0	0.0E+0	6.06E-6	2.73E-3
NHWD	[kg]	3.41E-1	6.73E-4	9.87E-4	3.24E-1	2.32E-5	4.93E-5	4.3E-2	-3.95E-2
RWD	[kg]	2.66E-3	2.03E-6	1.53E-6	1.09E-1	2.48E-7	1.66E-5	1.51E-7	-9.77E-5
CRU	[kg]	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	-
MFR	[kg]	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	-
MER	[kg]	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	-
EEE	[MJ]	0.0E+0	8.84E-2	0.0E+0	0.0E+0	0.0E+0	0.0E+0	2.32E-2	-
EET	[MJ]	0.0E+0	2.492E-1	0.0E+0	0.0E+0	0.0E+0	0.0E+0	5.94E-2	-

Caption	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; EEE = Exported thermal energy

6. LCA: Interpretation

This chapter contains an interpretation of the Life Cycle Impact Assessment categories. When expressed as a percentage, the impact refers to its magnitude as a percentage of total product impact across all modules, with the exception of module D.

Production phase (module A1-A3) contributes 2% to total impact assessment for Depletion Potential of the

Stratospheric Ozone Layer (ODP) category and almost 100% - for Abiotic Depletion Potential for Non Fossil Resources (ADPE). For all other categories this values ranges between 14% and 25%. The environmental impacts for the transport (A2) have a negligible impact within this stage.

To reflect the use phase corresponding to the RSL stated in this EPD, energy consumption was considered and has a major contribution for each impact assessment category between 74% and 86%, with exception of ADPE (0.5%).

In module D the benefits (negative values) and loads beyond the system boundary are declared for the recycling potential of the metals and for the credits from the incineration process (energy substitution) within A5.

7. Requisite evidence

Not applicable in this EPD.

8. References

Institut Bauen und Umwelt
Institut Bauen und Umwelt e.V., Berlin (pub.): Generation of Environmental Product Declarations (EPDs);

General principles
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www.bau-umwelt.de

PCR Part A
Institut Bauen und Umwelt e.V., Königswinter (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. April 2013
www.bau-umwelt.de

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

EN 15804
EN 15804:2012-04: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

DIN EN 12209
DIN EN 12209: Building hardware - Locks and latches - Mechanically operated locks, latches and locking plates - Requirements and test methods

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

DIN EN 1125
DIN EN 1125: Building hardware - Panic exit devices operated by a horizontal bar, for use on escape routes - Requirements and test methods

BS OHSAS 18002
BS OHSAS 18002: Occupational health and safety management systems. Guidelines for the implementation of OHSAS 18001:2007

OHSAS 18001
OHSAS 18001: Occupational health and safety management systems. Requirements

DIN EN ISO 14001
DIN EN ISO 14001: Environmental management systems - Requirements with guidance for use (ISO 14001:2004 + Cor. 1:2009)

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

DIN EN ISO 9001
DIN EN ISO 9001: Quality management systems - Requirements (ISO 9001:2008); Trilingual version EN ISO 9001:2008

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: Requirements on the EPD for Locks and fittings.
www.bau-umwelt.com

GABI 6 2013
GABI 6 2013: PE INTERNATIONAL AG; GaBi 6: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, Leinfelden-Echterdingen, 1992-2013

GaBi 6 2013D
GaBi 6 2013D: GaBi 6: Documentation of GaBi 6: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, Leinfelden-Echterdingen, 1992-2013. http://documentation.gabi-software.com/

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