ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

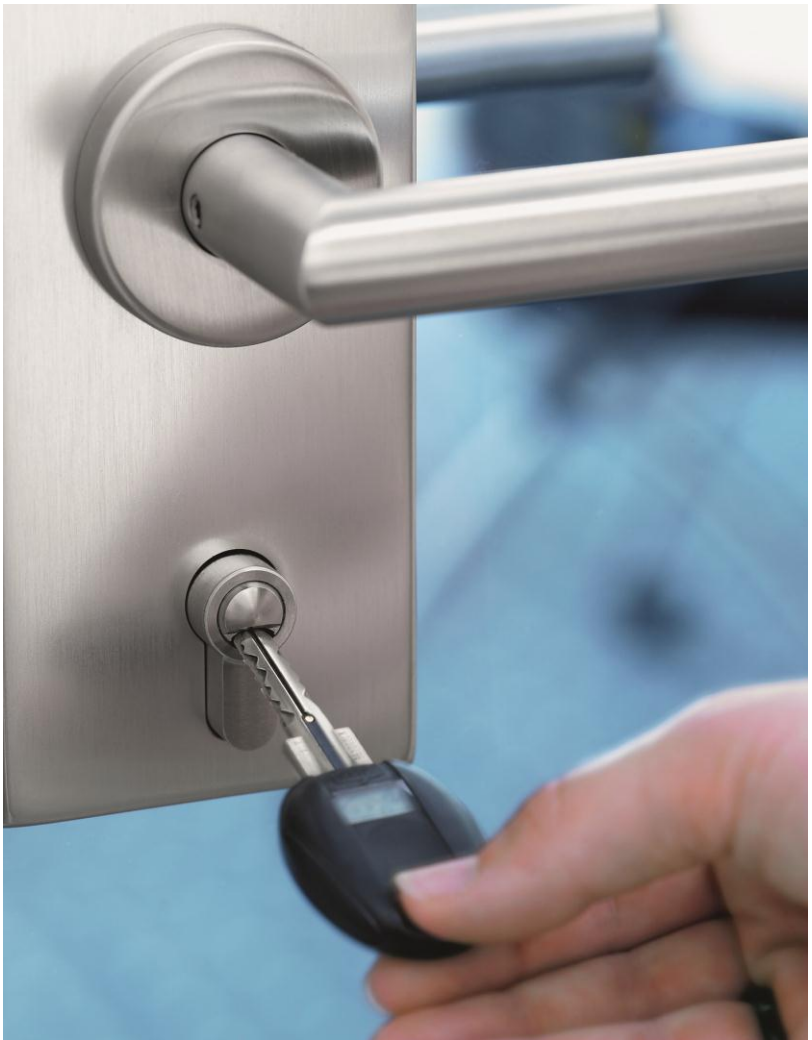
Owner of the Declaration	**ASSA ABLOY Sicherheitstechnik GmbH**
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ASA-20150229-IBA1-EN
Issue date	21.08.2015
Valid to	20.08.2020

Access control systems – VERSO CLIQ cylinder

ASSA ABLOY Sicherheitstechnik GmbH

Institut Bauen und Umwelt e.V.

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



1. General Information

ASSA ABLOY Sicherheitstechnik GmbH

Programme holder
IBU - Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Declaration number
EPD-ASA-20150229-IBA1-EN

This Declaration is based on the Product Category Rules:
Electronic Access Control Systems, 11-2013
(PCR tested and approved by the independent expert committee (SVR))

Issue date
21.08.2015

Valid to
20.08.2020

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

Dr.-Ing. Burkhart Lehmann
(Managing Director IBU)

VERSO CLIQ europrofile cylinder

Owner of the Declaration
ASSA ABLOY Sicherheitstechnik GmbH
Goerzallee 299,
14167 Berlin
GERMANY

Declared product / Declared unit
This Declaration represents 1 VERSO CLIQ europrofile cylinder, length 35/35mm, one-sided electronics.

Scope:
The Life Cycle Assessment is based on data collected from the cylinder production facility in Berlin, Germany
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.

Verification

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

Dr Wolfram Trinius
(Independent verifier appointed by SVR)

2. Product

2.1 Product description
The VERSO CLIQ cylinder, produced by IKON, an ASSA ABLOY Group brand, is a mechatronic cylinder that combines the VERSO mechanical system with the ASSA ABLOY CLIQ chip technology. The VERSO CLIQ cylinder secures doors but also other openings and enables flexible access rights, a possibility to block lost keys and an event based audit trail.

2.2 Application
The VERSO CLIQ cylinder is suitable for indoor and outdoor use and is available in multiple different cylinder variations. Common applications include Commercial buildings, Office buildings; Education establishments, Healthcare buildings and Infrastructure.

2.3 Technical Data
The product has the following technical properties:

Technical data

Name	Value	Unit
Mounting	In euro profile locks and fittings	-
Power supply	3VDC	V
Current Requirements	100mA	A
Operating Temperature	-25 to 85°C	°C
Operating Humidity	5 to 95 %	%
Power consumption	0.03	W

2.4 Placing on the market / Application rules
For the placing on the market of the products in the EU/EFTA (with the exception of Switzerland) the following harmonization legislation of the European Union applies:

- Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (LVD directive)

- Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC (EMC directive)

- Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS directive).

The products are subject to CE marking according to the relevant harmonization legislation.

a. LVD directive : Affixing the CE marking to the products means the compliance of products with the LVD directive.
b. EMC directive: Affixing the CE marking to the products means the compliance of products with the EMC directive.
c. RoHS directive: Affixing the CE marking to the products means the compliance of the products with the RoHS directive.

The following standards apply:
• EN 1303 - Building hardware - Cylinders for locks - Requirements and test methods
• DIN 18252 - Profile cylinders for door locks - Terminology, dimensions, requirements and marking
• EN 61000-6-2:2005 Information technology equipment - EMC
• EN 61000-6-3:2007/A1:2011 Information technology equipment – EMC
• IEC 60950-1:2005+A1 Information technology equipment - Safety
• EN 60950-1: 2006 + A11 + A1 + A12 Information technology equipment – Safety
• EN 50581:2012 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

For the application and use of the products the respective national provisions apply.

2.5 Delivery status
Cylinders are delivered in packs of up to three cylinders with mounting screw. Packaged cylinder dimensions: 16,5cm x 10cm x 5cm

2.6 Base materials / Ancillary materials
The composition of the cylinder in percentages (%) of total mass per unit is as follows:

Component	Percentage in mass (%)
Brass	82.33
Copper	2.86
Plastics	0.34
Stainless Steel	0.94
Steel	6.51
Electro mechanics	0.74
Others	6.28
Total	**100.0**

2.7 Manufacture
The VERSO CLIQ cylinder is assembled at the production facility at ASSA ABLOY Sicherheitstechnik, Berlin - Germany. Main components are sourced from suppliers within Germany and the Czech Republic. The electronic components, including PCB, are purchased externally from suppliers in China. During assembly the individual parts are assembled into the cylinder housing. The assembled cylinder is then packaged with the mounting screw for shipment.

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.
- Environmental operations, GHG, energy, water, waste, VOC, surface treatment and H&S are being routinely monitored. Inspections, audits, and reviews are conducted periodically to ensure that applicable standards are met and the effectiveness of environment management program is evaluated.
- Code of Conduct covers human rights, labor 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.
- The factory in Berlin, Germany has certification of Environmental Management to ISO 14001:2004.
- Any waste metals during machining are separated and recycled. The waste from the water-based painting process is delivered to waste treatment plant.

2.9 Product processing/Installation
VERSO CLIQ cylinders are installed by trained distribution partners or by the product end user. Installation instructions are included with each cylinder unit.

2.10 Packaging
The cylinder is packed in a cardboard box to avoid damage. Also included in the packaging are paper installation instructions and the mounting screw. Packaging materials shall be collected separately for recycling.

Material	Value (%)
Cardboard/paper	100.0
Total	**100.0**

All materials incurred during installation are directed to a recycling unit.
Waste codes according to European Waste Catalogue and Hazardous Waste List - Valid from 1 January 2002.
EWC 15 01 01 paper and cardboard packaging

2.11 Condition of use
Special lubrication (Synthetic grease based on metal-soap) is used for maintenance of the cylinder. Repairs or replacement are not usually necessary. No cleaning efforts need to be taken into consideration.

2.12 Environment and health during use
There are no interactions between products, the environment and health.

2.13 Reference service life
The service life of the VERSO CLIQ cylinder is estimated to be 15 years.

2.14 Extraordinary effects

Fire

Suitable for use in fire and smoke doors (DIN EN 18252)

Water

No substances are used which have a negative impact on ecological water quality on contact by the device with water.

Mechanical destruction

No danger to the environment can be anticipated during mechanical destruction.

2.15 Re-use stage

The product is possible to re-use during the reference service life and be moved to one door to another.

2.16 Disposal

The majority, of components is brass and steel which can be recycled. The cylinder can be mechanically dissembled to separate the different materials.

Disposal of the product is subject to the WEEE Directive within Europe, Directive 2012/19/EU.

2.17 Further information

More information on ASSA ABLOYSicherheitstechnik GmbH and VERSO CLIQ cylinders is available by:

ASSA ABLOY Sicherheitstechnik GmbH
Attilastrasse 61-67
12105 Berlin
Germany
Tel: +493081060
Internet: www.assaabloy.de

3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of VERSO CLIQ cylinder as specified in Part B requirements on the EPD for Electronic Access Control Systems /IBU PCR Part B/.

Declared unit

Name	Value	Unit
Declared unit	1	piece of VERSO CLIQ cylinder
Conversion factor to 1 kg	4.947	-

3.2 System boundary

Type of the EPD: cradle to gate - with options
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:

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

End-of-life stage:

- C2 – Transport to waste processing,
- C3 – Waste processing for 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 state or disposal of final residues.
Module D:

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

3.3 Estimates and assumptions

Usestage:
For the use stage, it is assumed that the lock is used in the European Union, thus an European electricity grid mix is considered within this stage.

EoL stage:
In the End-of-Life stage, for all the materials which can be recycled, a recycling scenario with 100% collection rate was assumed.

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), thermal energy consumption 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 modeling of the considered products, the GaBi 6 Software System for Life Cycle Engineering, developed by thinkstep 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/.
thinkstep AG 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
- Waste incineration of paper
- Thermal treatment of plastic parts
- Waste incineration of electronic scraps (PWB)

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 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

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).

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site: paper packaging	0.056	kg

Reference service life

Name	Value	Unit
Reference service life	15	a

Operational energy use (B6)

Name	Value	Unit
Electricity consumption	0.986	kWh
Years of use	15	a
Days per year in use	365	d
Hours per day in on mode	0.5	h
Hours per day in stand-by mode	23.5	h
Power consumption on mode	0.9	W
Power consumption stand-by mode	0.000006	W

End of life (C2-C4)

Name	Value	Unit
Collected separately Brass, Copper, Plastic Parts, Stainless Steel, Steel, Electro mechanics,	0.189	kg
Collected as mixed construction waste construction waste for landfilling	0.013	kg
Recycling Brass	0.166	kg
Recycling Copper	0.006	kg
Reuse plastic parts	0.001	kg
Recycling stainless steel	0.002	kg
Recycling steel	0.013	kg
Recycling electro-mechanics	0.001	kg
Landfilling construction waste for landfill	0.013	kg

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

Name	Value	Unit
Collected separately waste Card reader (including packaging)	0.258	kg
Recycling Brass	64.47	%
Recycling Copper	2.24	%
Recycling Stainless Steel	0.75	%
Recycling Steel	5.09	%
Recycling/Reuse Electronics	0.58	%
Reuse plastic parts	0.26	%
Reuse Paper packaging	21.69	%
Loss Construction waste for landfilling (no recycling potential)	4.92	%

5. LCA: Results

Results shown below were calculated using CML 2000 – Apr. 2013 Methodology.

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	X	X	MND	MND	MND	MND	MND	X	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece of VERSO CLIQ cylinder

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	1.03E+00	6.11E-03	7.93E-02	3.90E-02	1.22E-04	7.30E-05	1.81E-03	-1.48E-01
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	2.13E-10	2.93E-14	3.63E-13	2.67E-11	5.85E-16	4.99E-14	5.42E-15	-1.62E-11
AP	Acidification potential of land and water	[kg SO_2-Eq.]	5.42E-03	2.80E-05	1.81E-05	1.84E-04	5.59E-07	3.44E-07	4.86E-07	-9.50E-04
EP	Eutrophication potential	[kg $(PO_4)^{3-}$-Eq.]	4.70E-04	6.39E-06	3.16E-06	1.04E-05	1.28E-07	1.94E-08	4.54E-08	-6.57E-05
POCP	Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	3.50E-04	-9.02E-06	1.28E-06	1.09E-05	-1.80E-07	2.04E-08	2.50E-08	-6.52E-05
ADPE	Abiotic depletion potential for non fossil resources	[kg Sb Eq.]	2.53E-04	2.30E-10	1.43E-09	5.40E-09	4.61E-12	1.01E-11	1.47E-10	-1.53E-04
ADPF	Abiotic depletion potential for fossil resources	[MJ]	1.29E+01	8.43E-02	2.22E-02	4.43E-01	1.69E-03	8.28E-04	8.06E-04	-1.79E+00

RESULTS OF THE LCA - RESOURCE USE: One piece of VERSO CLIQ Cylinder

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	3.30E+00	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	3.30E+00	3.32E-03	2.07E-03	1.27E-01	6.65E-05	2.37E-04	6.45E-05	-1.36E-01
PENRE	Non renewable primary energy as energy carrier	[MJ]	1.61E+01	-	-	-	-	-	-	-
PENRM	Non renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PENRT	Total use of non renewable primary energy resources	[MJ]	1.61E+01	8.46E-02	2.60E-02	6.94E-01	1.69E-03	1.30E-03	9.04E-04	-1.94E+00
SM	Use of secondary material	[kg]	2.80E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	Use of renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	Use of non renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	Use of net fresh water	[m^3]	1.16E-02	2.34E-06	2.31E-04	3.13E-04	4.69E-08	5.86E-07	4.72E-06	-1.03E-03

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of VERSO CLIQ Cylinder

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	1.94E-03	1.93E-07	1.79E-06	9.62E-05	3.85E-09	1.80E-07	7.43E-08	-5.06E-05
NHWD	Non hazardous waste disposed	[kg]	8.32E-02	1.06E-05	1.99E-03	2.24E-04	2.13E-07	4.19E-07	1.82E-04	6.16E-03
RWD	Radioactive waste disposed	[kg]	1.26E-03	1.11E-07	1.52E-06	1.00E-04	2.22E-09	1.87E-07	3.88E-08	-5.85E-05
CRU	Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
MFR	Materials for recycling	[kg]	0.00E+00	0.00E+00	5.60E-02	0.00E+00	0.00E+00	1.87E-01	0.00E+00	
MER	Materials for energy recovery	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
EEE	Exported electrical energy	[MJ]	0.00E+00	0.00E+00	1.00E-01	0.00E+00	0.00E+00	0.00E+00	3.25E-03	
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	2.83E-01	0.00E+00	0.00E+00	0.00E+00	8.91E-03	

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 production stage (modules A1-A3) contributes between 93% and 100% to the overall results for all the environmental impact assessment categories hereby considered. Within the production stage, the main contribution for all the impact categories is the production of steel mainly due to the energy consumption on this process. Zinc, steel and stainless steel account in total with app. 86% to the overall mass of the product, therefore, the impacts are in line with the mass composition of the product. The environmental impacts for the transport (A2) have a negligible impact within this stage.

To reflect the use stage (module B6), the energy consumption was included and it has a minor contribution for all the impact assessment categories considered - between < 1% and 7%. This is a result of low operational energy use.

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

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

General principles
for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013-04
www.bau-umwelt.de

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. April 2013
www.bau-umwelt.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: Requirements on the EPD for Electronic Access Control Systems. www.bau-umwelt.com

ISO 9001:1994
Quality systems – Model for quality assurance in design, development, production, installation and servicing

ISO 14001:1999
Environmental Management System Certificate

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

EN 15804
EN 15804:2012+A1:2014: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

EN 1634:2000
Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware

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

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

EN 1303
EN 1303: Building hardware - Cylinders for locks - Requirements and test methods

DIN 18252
DIN 18252: Profile cylinders for door locks - Terminology, dimensions, requirements and marking

9. Annex

Results shown below were calculated using TRACI Methodology.

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	X	X	MND	MND	MND	MND	MND	X	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece of VERSO CLIQ Cylinder

Parameter	Parameter	Unit	A1-3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	1.03E+00	6.11E-03	7.93E-02	3.90E-02	1.22E-04	7.30E-05	1.81E-03	-1.48E-01
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	2.28E-10	3.11E-14	3.86E-13	2.84E-11	6.22E-16	5.31E-14	5.76E-15	-1.84E-11
AP	Acidification potential of land and water	[kg SO_2-Eq.]	5.36E-03	3.65E-05	2.19E-05	1.74E-04	7.31E-07	3.26E-07	5.75E-07	-9.17E-04
EP	Eutrophication potential	[kg N-eq.]	5.07E-04	2.58E-06	1.26E-06	7.41E-06	5.16E-08	1.39E-08	2.10E-08	-3.08E-05
Smog	Ground-level smog formation potential	[kg O_3-eq.]	6.14E-02	7.52E-04	5.11E-04	1.58E-03	1.50E-05	2.95E-06	6.16E-06	-1.05E-02
Resources	Resources – fossil resources	[MJ]	1.05E+00	1.21E-02	2.61E-03	3.15E-02	2.43E-04	5.90E-05	8.24E-05	-1.54E-01

RESULTS OF THE LCA - RESOURCE USE: One piece of VERSO CLIQ Cylinder

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	3.30E+00	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	3.30E+00	3.32E-03	2.07E-03	1.27E-01	6.65E-05	2.37E-04	6.45E-05	-1.36E-01
PENRE	Non renewable primary energy as energy carrier	[MJ]	1.61E+01	-	-	-	-	-	-	-
PENRM	Non renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PENRT	Total use of non renewable primary energy resources	[MJ]	1.61E+01	8.46E-02	2.60E-02	6.94E-01	1.69E-03	1.30E-03	9.04E-04	-1.94E+00
SM	Use of secondary material	[kg]	2.80E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	Use of renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	Use of non renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	Use of net fresh water	[m³]	1.16E-02	2.34E-06	2.31E-04	3.13E-04	4.69E-08	5.86E-07	4.72E-06	-1.03E-03

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of VERSO CLIQ Cylinder

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	1.94E-03	1.93E-07	1.79E-06	9.62E-05	3.85E-09	1.80E-07	7.43E-08	-5.06E-05
NHWD	Non hazardous waste disposed	[kg]	8.32E-02	1.06E-05	1.99E-03	2.24E-04	2.13E-07	4.19E-07	1.82E-04	6.16E-03
RWD	Radioactive waste disposed	[kg]	1.26E-03	1.11E-07	1.52E-06	1.00E-04	2.22E-09	1.87E-07	3.88E-08	-5.85E-05
CRU	Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
MFR	Materials for recycling	[kg]	0.00E+00	0.00E+00	5.60E-02	0.00E+00	0.00E+00	1.87E-01	0.00E+00	-
MER	Materials for energy recovery	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
EEE	Exported electrical energy	[MJ]	0.00E+00	0.00E+00	1.00E-01	0.00E+00	0.00E+00	0.00E+00	3.25E-03	-
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	2.83E-01	0.00E+00	0.00E+00	0.00E+00	8.91E-03	-

Publisher
Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Tel +49 (0)30 3087748- 0
Fax +49 (0)30 3087748- 29
Mail info@bau-umwelt.com
Web **www.bau-umwelt.com**

Programme holder
Institut Bauen und Umwelt e.V.
Panoramastr 1
10178 Berlin
Germany

Tel +49 (0)30 - 3087748- 0
Fax +49 (0)30 – 3087748 - 29
Mail info@bau-umwelt.com
Web **www.bau-umwelt.com**

Author of the Life Cycle Assessment
thinkstep AG
Hauptstraße 111
70771 Leinfelden-Echterdingen
Germany

Tel +49 711 34 18 17 22
Fax +49 711 34 18 17 25
Mail infg@thinkstep.com
Web **www.thinkstep.com**

Owner of the Declaration
ASSA ABLOY Sicherheitstechnik GmbH
Attilastrasse 61-67
12105 Berlin
Germany

Tel +493081060
Web **Internet: www.assaabloy.de**