# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

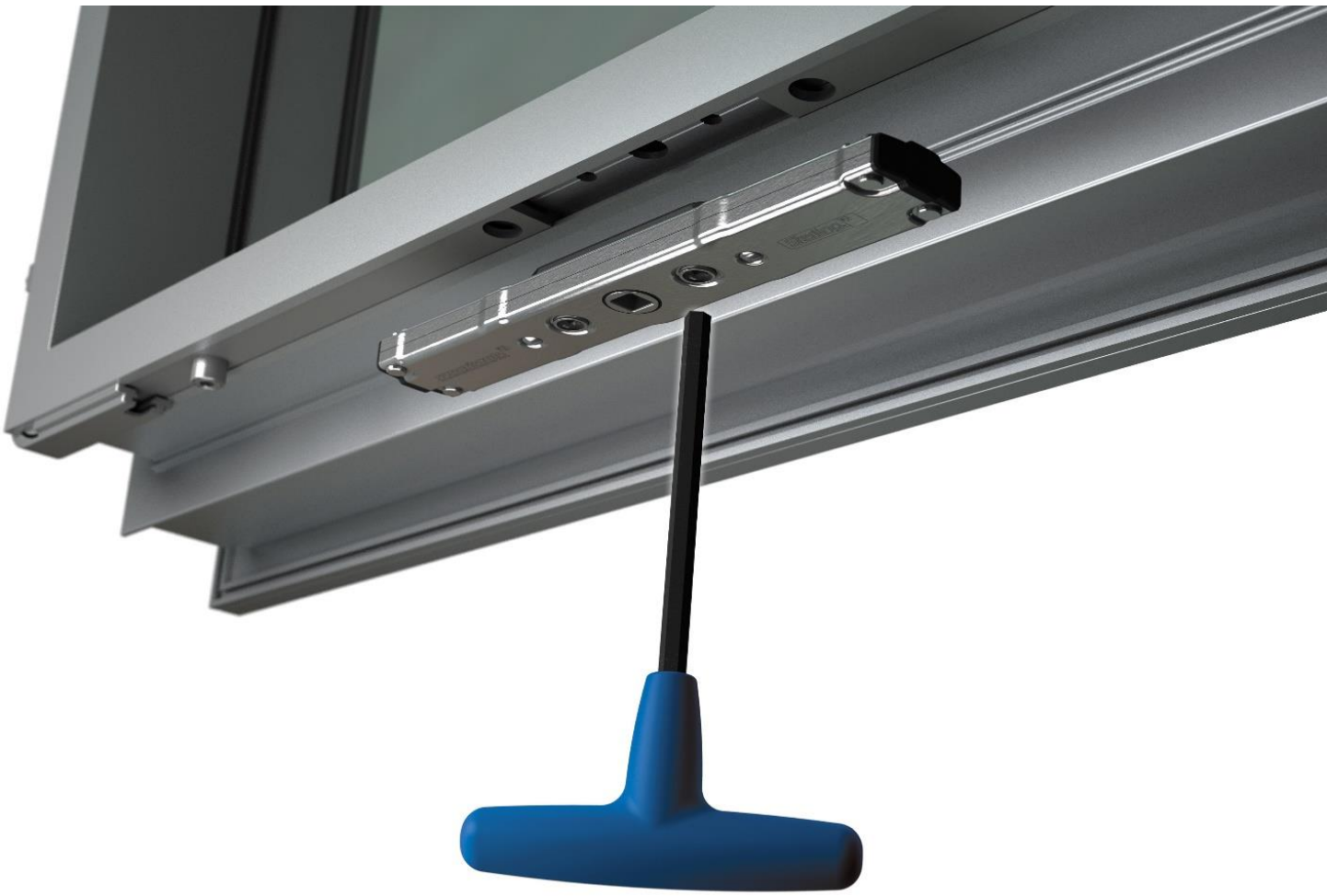
| | |
|---|---|
| Owner of the Declaration | ASSA ABLOY |
| Programme holder | Institut Bauen und Umwelt e.V. (IBU) |
| Publisher | Institut Bauen und Umwelt e.V. (IBU) |
| Declaration number | EPD-ASA-201600256-IBA1-EN |
| Issue date | 06.02.2017 |
| Valid to | 05.02.2022 |

**Securistyle – Sterling Lock**

# ASSA ABLOY

Institut Bauen und Umwelt e.V.

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



ASSA ABLOY

# 1. General Information

## ASSA ABLOY – Securistyle

**Programme holder**

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

**Declaration number**

EPD-ASA-201600256-IBA1-EN

**This Declaration is based on the Product Category Rules -PCR:**

Locks and fittings, 07.2014
(PCR tested and approved by the independent expert committee (SVR))

**Issue date**

06.02.2017

**Valid to**

05.02.2022

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

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

## Securistyle Sterling Lock

**Owner of the Declaration**

SECURISTYLE Kingsmead Ind Est
Princess Elizabeth Way,
Cheltenham Glos
UK GL51 7RE

**Declared product / Declared unit**

The declaration represents one commercial restrictor – Securistyle Sterling Lock

**Scope:**

This declaration and its LCA study are relevant to the Securistyle Sterling Lock manufactured for Securistyle in China & Cheltenham UK.

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 according to ISO 14025 |
| ☐ internally ☒ externally |

Dr. Wolfram Trinius
(Independent verifier appointed by SVR)

# 2. Product

### 2.1 Product description

**Product name:** Securistyle Sterling Lock
**Product characteristic:**

- Securistyle Sterling Lock consist of a single gearbox.
- The gearbox assembly consists of a number of patented unique features that include a cam-action retention system, bi-directional drive, interchangeable connection system, stainless steel housing.
- The gearbox provides bi-directional drive for a perimeter locking system with multiple locking points.
- Product is normally used in commercial applications and is produced from Austenitic grade 304 stainless steel for corrosion resistance and strength.
- Gearbox is capable of being retained in position without the need to fit the handle, which prevents handle damage during transportation of the window.
- Can be manually or automatically operated.

### 2.2 Application

Securistyle Sterling Lock consists of a range of gearboxes offered in various configurations of connection sizes to provide solutions for perimeter locking to provide weather sealing and security for varying commercial vents.

### 2.3 Technical Data

The table presents the technical properties of Securistyle Sterling Lock:

**Technical data**

| Parameter | Value |
|---|---|
| Available finishes: | Natural stainless steel finish |
| Available Sizes: | SLT1406, SLT1410, SLT1506, SLT1510, SLT1606, SLT1610 |
| Height: | 10 mm |
| Width: | 26 mm |

### 2.4 Placing on the market / Application rules

For the product no DoP and no CE-marking are applicable, because no harmonized technical specifications exist.
For the application and use of the product the respective national Provisions apply.

The standards that can be applied for Securistyle Sterling Lock are:

- EN 13126-1
- EN 13126-4
- BS6375 pt 2

### 2.5 Delivery status

Securistyle Sterling Locks are packed by 50 singles in box sizes up to 295mm x 115mm x 195mm

### 2.6 Base materials / Ancillary materials

The primary product components and/or materials must be indicated as a percentage mass to enable the user of the EPD to understand the composition of the product in delivery status.

The average composition for Securistyle Sterling Locks are as following:

| Component | Percentage in mass (%) |
|---|---|
| Plastics | 16.35 |
| Stainless Steel | 83.65 |
| **Total** | **100.0** |

### 2.7 Manufacture

The manufacturing processes occurs at:
1) Securistyle factory: Final build assembly - manual assembly, riveting, checking and complete packing of product and 2) Union Tool in China - pressing, punching, forming and manual assembly.
The factory of Securistyle, Princess Elizabeth Way, Cheltenham, Glos GL51 7RE has a certification of Quality Management system in accordance with ISO 9001:2008 (Certificate Number FM11016). The factory of Union Tool, No. 9 Fengyang 3rd. Road, Beilun District, Ningbo City, Zhejiang Province, and Peoples Republic of China has a certification of Quality Management system in accordance with ISO 9001:2008 (Certificate Number 1903)

### 2.8 Environment and health during manufacturing

- Environmental operations, GHG, energy, water, waste, VOC, surface treatment and H&S are routinely monitored. Inspections, audits, and reviews are conducted periodically to ensure that applicable standards are met and to evaluate the effectiveness of the environmental management program.
- The manufacturing site in Cheltenham has an environmental management system certified according to ISO 14001:2004
- Any waste metals during machining are separated and recycled.

### 2.9 Product processing/Installation

Sterling Locks are distributed through and installed by trained installation technicians, such as façade engineers, curtain wall builders, etc., adhering to local/national standards and requirements

### 2.10 Packaging

Sterling Locks are packed in 50 singles in a cardboard box. The packaging is fully recyclable with maximum dimensions: 295 mm x 195mm x 115 mm

| Material | Percentage in mass (%) |
|---|---|
| Cardboard/paper | 2.86 |
| Plastics | 97.14 |
| **Total** | **100.0** |

### 2.11 Condition of use

In façade openings fitted with the opening cavity of a vent. Must be installed and maintained in line with Securistyle recommendations - cleaning of dust & debris and light lubrication with engineering oil.

### 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 use of the product.

### 2.13 Reference service life

Approved for 20,000 cycles under normal working conditions, 12 years depending on cycle frequency.

### 2.14 Extraordinary effects

**Fire**
N/A

**Water**
Contain no substances that have any impact on water in case of flood.

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

### 2.15 Re-use stage

It is possible to re-use the product during the reference service life and it can be moved from one window to another. The majority, by weight, of components is stainless steel, which can be recycled. The plastic components can be used for energy recovery within a waste incineration process.

### 2.16 Disposal

No disposal is foreseen for the product nor for the corresponding packaging.

### 2.17 Further information

SECURISTYLE Kingsmead Ind Est
Princess Elizabeth Way
Cheltenham
GL51 7RE (UK)
Tel +44 1242 221200
Web **www.securistyle.co.uk**

# 3. LCA: Calculation rules

### 3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of Securistyle Sterling Lock as specified in Part B requirements on the EPD for PCR Locks and fittings: (mechanical & electromechanical locks & fittings).

**Declared unit**

| Name | Value | Unit |
|---|---|---|
| Declared unit | 0.1602 kg | 1 piece of lock |
| Conversion factor to 1 kg | 6.242 | - |

### 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

End-of-life stage:

- C2 – Transport to waste processing
- C3 – Waste processing
- C4 – Disposal (landfill)

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.

- D - Declaration of all benefits and loads

### 3.3 Estimates and assumptions

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

EoL: 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 modelling 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 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 2013/14 (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. In this EPD, the following specific life cycle inventories for the WIP are considered for:

- Waste incineration of plastic
- Waste incineration of paper

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

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) | 0.0001 | kg |
| Output substances following waste treatment on site (Plastics packaging) | 0.0034 | kg |

**Reference service life**

| Name | Value | Unit |
|---|---|---|
| Reference service life | 12 | a |

**End of life (C2-C4)**

| Name | Value | Unit |
|---|---|---|
| Collected separately Plastics, Stainless Steel | 0.1602 | kg |
| Recycling Stainless Steel | 0.134 | kg |
| Reuse Plastic Parts | 0.0263 | kg |
| Reuse Paper | 0.0034 | kg |

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

| Name | Value | Unit |
|---|---|---|
| Collected separately waste type (including packaging) | 0.1637 | kg |
| Recycling Stainless Steel | 81.85 | % |
| Reuse Paper | 16.07 | % |
| Reuse Plastics | 2.08 | % |

## 5. LCA: Results

Results shown below were calculated using CML 2000 – Apr. 2013 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 | MND | MND | MND | X | X | X | X |

**RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece Securistyle Sterling Lock**

| Parameter | Parameter | Unit | A1 - A3 | A4 | A5 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| GWP | Global warming potential | [kg $CO_2$-Eq.] | 1.14E+00 | 3.90E-03 | 4.81E-03 | 3.80E-04 | 0.00E+00 | 6.57E-02 | -2.02E-01 |
| ODP | Depletion potential of the stratospheric ozone layer | [kg CFC11-Eq.] | 6.00E-11 | 1.87E-14 | 2.20E-14 | 1.82E-15 | 0.00E+00 | 1.98E-13 | -1.57E-11 |
| AP | Acidification potential of land and water | [kg $SO_2$-Eq.] | 7.59E-03 | 1.78E-05 | 1.10E-06 | 1.74E-06 | 0.00E+00 | 1.67E-05 | -1.33E-03 |
| EP | Eutrophication potential | [kg $(PO_4)^{3-}$- Eq.] | 5.51E-04 | 4.08E-06 | 1.92E-07 | 3.98E-07 | 0.00E+00 | 1.27E-06 | -8.06E-05 |
| POCP | Formation potential of tropospheric ozone photochemical oxidants | [kg Ethen Eq.] | 5.08E-04 | -5.76E-06 | 7.79E-08 | -5.62E-07 | 0.00E+00 | 8.13E-07 | -9.25E-05 |
| ADPE | Abiotic depletion potential for non-fossil resources | [kg Sb Eq.] | 2.64E-04 | 1.47E-10 | 8.69E-11 | 1.43E-11 | 0.00E+00 | 4.34E-09 | -6.81E-05 |
| ADPF | Abiotic depletion potential for fossil resources | [MJ] | 1.39E+01 | 5.38E-02 | 1.35E-03 | 5.25E-03 | 0.00E+00 | 2.78E-02 | -2.26E+00 |

**RESULTS OF THE LCA - RESOURCE USE: One piece Securistyle Sterling Lock**

| Parameter | Parameter | Unit | A1 - A3 | A4 | A5 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| PERE | Renewable primary energy as energy carrier | [MJ] | 1.30E+00 | - | - | - | - | - | - |
| PERM | Renewable primary energy resources as material utilization | [MJ] | 0.00E+00 | - | - | - | - | - | - |
| PERT | Total use of renewable primary energy resources | [MJ] | 1.30E+00 | 2.12E-03 | 1.26E-04 | 2.07E-04 | 0.00E+00 | 2.04E-03 | -1.52E-01 |
| PENRE | Non-renewable primary energy as energy carrier | [MJ] | 1.49E+01 | - | - | - | - | - | - |
| PENRM | Non-renewable primary energy as material utilization | [MJ] | 0.00E+00 | - | - | - | - | - | - |
| PENRT | Total use of non-renewable primary energy resources | [MJ] | 1.49E+01 | 5.40E-02 | 1.58E-03 | 5.27E-03 | 0.00E+00 | 3.09E-02 | -2.40E+00 |
| SM | Use of secondary material | [kg] | 1.12E-01 | 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 |
| 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 |
| FW | Use of net fresh water | [$m^3$] | 6.83E-03 | 1.50E-06 | 1.40E-05 | 1.46E-07 | 0.00E+00 | 1.60E-04 | -1.00E-03 |

**RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece Securistyle Sterling Lock**

| Parameter | Parameter | Unit | A1 - A3 | A4 | A5 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| HWD | Hazardous waste disposed | [kg] | 6.46E-04 | 1.23E-07 | 1.09E-07 | 1.20E-08 | 0.00E+00 | 2.16E-06 | -3.23E-05 |
| NHWD | Non-hazardous waste disposed | [kg] | 2.26E-01 | 6.79E-06 | 1.21E-04 | 6.62E-07 | 0.00E+00 | 6.12E-03 | -3.97E-02 |
| RWD | Radioactive waste disposed | [kg] | 3.91E-04 | 7.07E-08 | 9.24E-08 | 6.90E-09 | 0.00E+00 | 1.23E-06 | -5.72E-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 | 3.40E-03 | 0.00E+00 | 1.34E-01 | 0.00E+00 | 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 | 6.09E-03 | 0.00E+00 | 0.00E+00 | 1.26E-01 | 0.00E+00 |
| EET | Exported thermal energy | [MJ] | 0.00E+00 | 0.00E+00 | 1.72E-02 | 0.00E+00 | 0.00E+00 | 3.45E-01 | 0.00E+00 |

## 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 94% 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 stainless steel, with approx. 98%, mainly due to the energy consumption on this process. Stainless steel accounts with the majority of 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.

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

**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

**ISO 14025**
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

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

**ISO 9001**
Quality management systems

**EN 13126**
Fittings for windows and window doors

**BS 6375-2:2009**
Performance of windows and doors. Classification for operation and strength characteristics and guidance onselection and specification

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

# 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 | MND | MND | MND | X | X | X | X |

## RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece Securistyle Sterling Lock

| Parameter | Parameter | Unit | A1 - A3 | A4 | A5 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| GWP | Global warming potential | [kg $CO_2$-Eq.] | 1.14E+00 | 3.90E-03 | 4.81E-03 | 3.80E-04 | 0.00E+00 | 6.57E-02 | -2.02E-01 |
| ODP | Depletion potential of the stratospheric ozone layer | [kg CFC11-Eq.] | 6.38E-11 | 1.99E-14 | 2.34E-14 | 1.94E-15 | 0.00E+00 | 2.10E-13 | -1.67E-11 |
| AP | Acidification potential of land and water | [kg $SO_2$-Eq.] | 7.49E-03 | 2.33E-05 | 1.33E-06 | 2.28E-06 | 0.00E+00 | 1.96E-05 | -1.28E-03 |
| EP | Eutrophication potential | [kg N-eq.] | 5.20E-04 | 1.65E-06 | 7.66E-08 | 1.61E-07 | 0.00E+00 | 5.98E-07 | -4.28E-05 |
| Smog | Ground-level smog formation potential | [kg $O_3$-eq.] | 9.64E-02 | 4.80E-04 | 3.10E-05 | 4.68E-05 | 0.00E+00 | 1.54E-04 | -1.44E-02 |
| Resources | Resources – resources fossil | [MJ] | 9.82E-01 | 7.74E-03 | 1.58E-04 | 7.55E-04 | 0.00E+00 | 2.86E-03 | -1.30E-01 |

## RESULTS OF THE LCA - RESOURCE USE: One piece Securistyle Sterling Lock

| Parameter | Parameter | Unit | A1 - A3 | A4 | A5 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| PERE | Renewable primary energy as energy carrier | [MJ] | 1.30E+00 | - | - | - | - | - | - |
| PERM | Renewable primary energy resources as material utilization | [MJ] | 0.00E+00 | - | - | - | - | - | - |
| PERT | Total use of renewable primary energy resources | [MJ] | 1.30E+00 | 2.12E-03 | 1.26E-04 | 2.07E-04 | 0.00E+00 | 2.04E-03 | -1.52E-01 |
| PENRE | Non-renewable primary energy as energy carrier | [MJ] | 1.49E+01 | - | - | - | - | - | - |
| PENRM | Non-renewable primary energy as material utilization | [MJ] | 0.00E+00 | - | - | - | - | - | - |
| PENRT | Total use of non-renewable primary energy resources | [MJ] | 1.49E+01 | 5.40E-02 | 1.58E-03 | 5.27E-03 | 0.00E+00 | 3E-02 | -2.40E+00 |
| SM | Use of secondary material | [kg] | 1.12E-01 | 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 |
| 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 |
| FW | Use of net fresh water | [$m^3$] | 6.83E-03 | 1.50E-06 | 1.40E-05 | 1.46E-07 | 0.00E+00 | 1.60E-04 | -1.00E-03 |

## RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece Securistyle Sterling Lock

| Parameter | Parameter | Unit | A1 - A3 | A4 | A5 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| HWD | Hazardous waste disposed | [kg] | 6.46E-04 | 1.23E-07 | 1.09E-07 | 1.20E-08 | 0.00E+00 | 2.16E-06 | -3.23E-05 |
| NHWD | Non-hazardous waste disposed | [kg] | 2.26E-01 | 6.79E-06 | 1.21E-04 | 6.62E-07 | 0.00E+00 | 6.12E-03 | -3.97E-02 |
| RWD | Radioactive waste disposed | [kg] | 3.91E-04 | 7.07E-08 | 9.24E-08 | 6.90E-09 | 0.00E+00 | 1.23E-06 | -5.72E-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 | - |
| MFR | Materials for recycling | [kg] | 0.00E+00 | 0.00E+00 | 3.40E-03 | 0.00E+00 | 1.34E-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 | - |
| EEE | Exported electrical energy | [MJ] | 0.00E+00 | 0.00E+00 | 6.09E-03 | 0.00E+00 | 0.00E+00 | 1.26E-01 | - |
| EET | Exported thermal energy | [MJ] | 0.00E+00 | 0.00E+00 | 1.72E-02 | 0.00E+00 | 0.00E+00 | 3.45E-01 | - |

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