ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	**TESA ASSA ABLOY**
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ASA-20150162-IBA1-EN
Issue date	10.06.2015
Valid to	09.06.2020

Access control systems - SMARTair Escutcheon

TESA ASSA ABLOY

Institut Bauen und Umwelt e.V.

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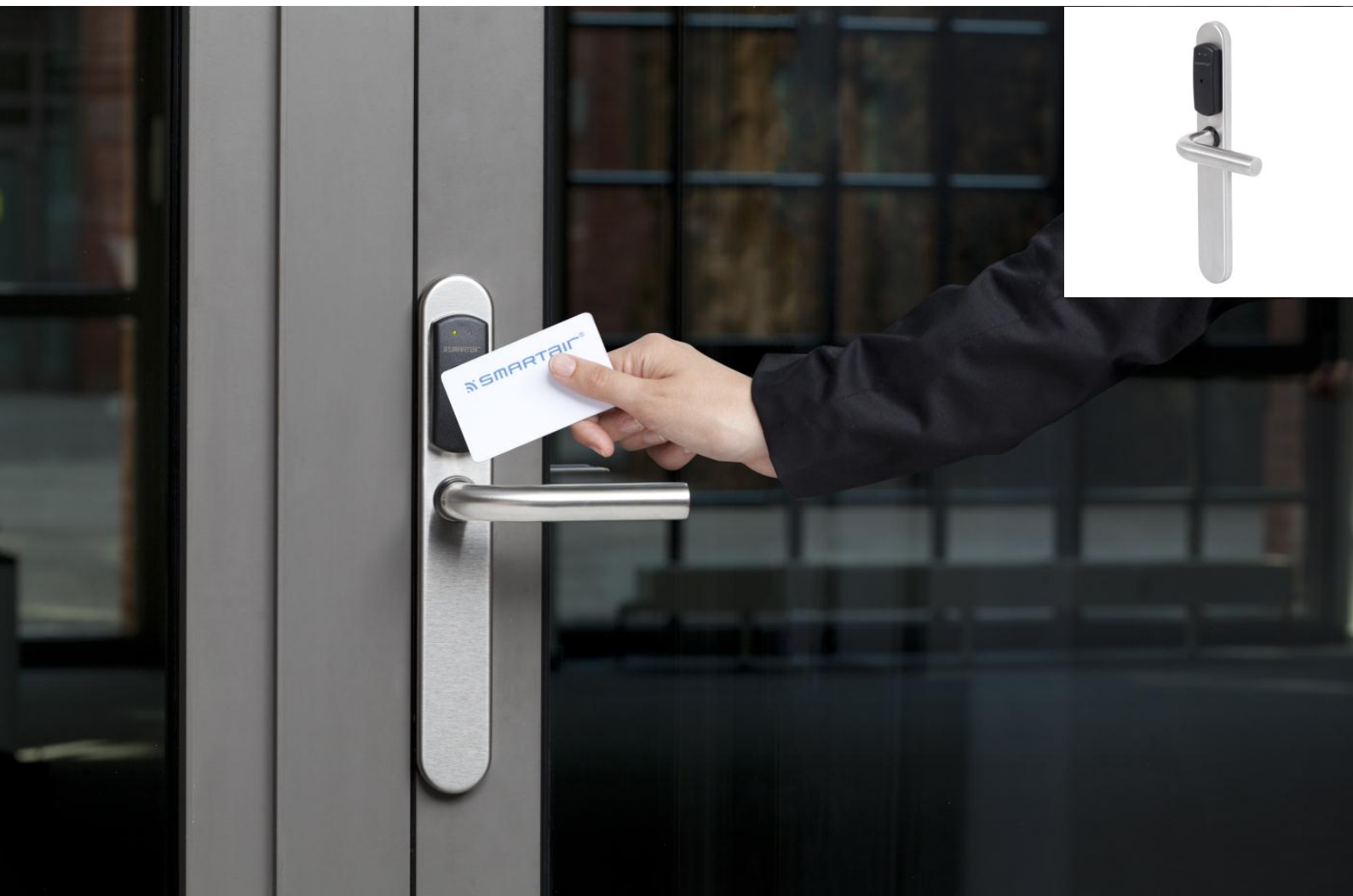

1. General Information

TESA ASSA ABLOY	SMARTair Escutcheon
Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the Declaration** TESA ASSA ABLOY Bº Ventas, 35 20305 Irun, Gipuzkoa SPAIN
Declaration number EPD-ASA-20150162-IBA1-EN	**Declared product / Declared unit** This Declaration represents 1 piece of SMARTair Escutcheon
This Declaration is based on the Product Category Rules: IBU: PCR Electronic Access Control Systems, 11-2013 (PCR tested and approved by the independent expert committee (SVA))	**Scope:** This declaration and its LCA study are relevant to SMARTair Escutcheon not including the mortise lock. Main primary manufacturing processes are made by external suppliers and the final manufacturing processes and assembly occur at our manufacturing factory in TESA, Spain. 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 10.06.2015	
Valid to 09.06.2020	**Verification** The CEN Standard EN 15804 serves as the core PCR Independent verification of the declaration and data according to ISO 14025 ☐ internally ☒ externally
Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)	
Dr.-Ing. Burkhart Lehmann (Managing Director IBU)	Dr Wolfram Trinius (Independent verifier appointed by SVA)

2. Product

2.1 Product description

The SMARTair Escutcheon, produced by TESA, an ASSA ABLOY Group brand, is a device that communicates with a personalized credential via RF technology. The Escutcheon reader collects identity information from the credential and passes it along to a secured control unit via electrical cable. The control unit then grants or denies access to the credential holder engaging the clutch of the Escutcheon allowing it to open the door. The reader is capable of communications using a high frequency RF signal and able to communicate with several credential formats.
Supported credential formats:
• iCLASS SE (Cards/Tags/Fobs)
• SE for DESFire EV1 (Cards/Tags/Fobs)
• SE for MIFARE Classic (Cards/Tags/Fobs)
• NFC compatible
• ISO/IEC 15693

2.2 Application

The SMARTair Escutcheon is suitable for indoor and outdoor use, where ID authentication is required. Common applications include: Commercial buildings, Industrial buildings, Government buildings, Military installations, Education establishments, Healthcare buildings.

2.3 Technical Data

The table presents the technical properties of SMARTair Escutcheon:

Technical data

Name	Value	Unit
Power supply	4,5VDC	V
Current Requirements	200mA	A
Operating Temperature	-20 to 70	°C
Operating Humidity	up to 85	%
Power consumption (standby)	6	µW
Peak Power Draw (During read)	900	mW

2.4 Placing on the market / Application rules

EMC Directive 2004/108/CE
LV Directive 2006/95/CE
R&TTE Directive 1999/05/CE
ROHS Directive 2011/65/CE

IP 54 Certified
Fire resistance (/UNE-EN 1634:2000/) 30' - 60' - 90'

2.5 Delivery status

Each Escutcheon unit is delivered individually packaged with mounting hardware, and gasket.
Packing dimensions: 220mm x 300mm x 50mm

2.6 Base materials / Ancillary materials

The composition of the card reader in percentages (%) of total mass per unit is as following:

Component	Percentage in mass (%)
Brass	2.98
Plastics	1.08
Stainless Steel	40.22
Steel	30.38
Zinc	16.25
Electronic	7.41
Others	1.68
Total	**100.0**

2.7 Manufacture

The SMARTair Escutcheon is assembled at the production facility at TESA, Irun. The electronics are produced in China and the mechanics in Spain. The components come from processes like stamped steel, turning, zinc and steel casting.
The factory of TESA has a certification of Quality Management system in accordance with /ISO 9001:1994/.

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 environmental management program effectiveness 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 of TESA has certification of Environmental Management to /ISO 14001:1999/.
• 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

SMARTair Escutcheons are installed by trained product integrators or by the product end user. Installation instructions are included with each unit.

2.10 Packaging

The Escutcheon is packed in a carton box with foam spacers to avoid damage. Also included in the packaging are paper installation instructions, the gasket, and a plastic bag containing the connectors and mounting hardware. Packaging materials shall be collected separately for recycling.

Material	Value (%)
Cardboard/paper	99.0
Plastic	1.0
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
EWC 15 01 02 plastic packaging.

2.11 Condition of use

No auxiliary or consumable materials are incurred for maintenance and usage of the reader. 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

Approved for a conservative value of 400.000 cycles under normal working conditions, that means 15 years depending on cycle frequency.

2.14 Extraordinary effects

Fire

Suitable for use in fire and smoke doors (/EN 1634:2000/).

Water

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

Mechanical destruction

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

2.15 Re-use phase

The product is possible to re-use during the reference service life and be moved to one door to another.
Waste codes according to European Waste Catalogue and Hazardous Waste List - Valid from 1 January 2002.
• /EWC/ 16 02 13* discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12
• /EWC/ 17 04 01 copper, bronze, brass
• /EWC/ 17 02 03 plastic
• /EWC/ 17 04 05 iron and steel
• /EWC/ 17 04 04 zinc
• /EWC/ 17 04 11 Cables with the exception of those outlined in 17 04 10.
Disposal of the product is subject to the WEEE Directive within Europe, Directive 2012/19/EU.

2.16 Disposal

The majority, of components is stainless steel, steel and zinc which can be recycled. The Escutcheons can be mechanically dissembled to separate the different

materials. 98.32% of the materials used are recyclable. The plastic components can be used for energy recovery in an incineration plant.
1.64% of the product is construction waste and gets deposited in landfill.

2.17 Further information

More information on TESA ASSA ABLOY SMARTair Escutcheons is available from:

TESA ASSA ABLOY
Bº Ventas, 35 20305
Irun, Gipuzkoa
SPAIN
Tel: +34 943669100
Internet: www.tesa.es

3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of SMARTair Escutcheon 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 SMARTair Escutcheon
Mass of product (without packaging)	1.724	kg
Conversion factor to 1 kg	0.580	-

3.2 System boundary

Type of the EPD: cradle to gate - with options
The following life cycle phases were considered for Reader:
A1-A3 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

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 stage.

EoL:
In the End-of-Life phase, 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 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
- 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).

Transport to the building site (A4)

Name	Value	Unit
Truck transport		
Litres of fuel diesel with maximum load (27 t payload)	39.4	l/100 km
Transport distance truck	2000	km
Capacity utilization (incl. empty runs) of truck	85	%
Ship transport		
Volume of heavy fuel oil with maximum load (27500 DWT)	5.3	m³/100 km
Transport distance ship	5000	km
Gross density of products transported	-	
Capacity utilization volume factor	-	

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site: paper packaging	0.0415	kg
Output substances following waste treatment on site: plastic packaging	0.0004	kg

Reference service life

Name	Value	Unit
Reference service life	15	a

Operational energy use (B6)

Name	Value	Unit
Electricity consumption	0.986	kWh
Days per year in use	365	d
Hours per day in different modes	24	h
Power consumption on mode	0.9	W
Power consumption stand-by mode	0.000006	W

End of life (C1-C4)

Name	Value	Unit
Collected separately Brass, Plastic Parts, Stainless Steel, Steel, Zinc, Electronic	1.695	kg
Collected as mixed construction waste construction waste for landfilling	0.029	kg
Recycling Brass	0.0514	kg
Reuse plastic parts	0.0186	kg
Recycling stainless steel	0.6932	kg
Recycling steel	0.5237	kg
Recycling zinc	0.28	kg
Recycling metals from electronic	0.1278	kg
Landfilling construction waste for landfill	0.029	kg

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

Name	Value	Unit
Collected separately waste Card reader (including packaging)	1.766	kg
Recycling Brass	2.91	%
Reuse plastic parts	1.05	%
Recycling Stainless Steel	39.27	%
Recycling Steel	29.66	%
Recycling Zinc	15.86	%
Recycling/Reuse Electronic	7.24	%
Reuse Paper packaging	2.35	%
Reuse Plastic packaging	0.02	%
Loss Construction waste for landfilling (no recycling potential)	1.64	%

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	X	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece of SMARTair Escutcheon

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	1.97E+01	4.41E-02	5.88E-02	4.68E-01	4.41E-02	2.12E-02	1.16E-01	-6.54E+00
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	4.51E-09	1.59E-12	2.69E-13	3.21E-10	1.59E-12	1.45E-11	3.64E-13	-3.88E-10
AP	Acidification potential of land and water	[kg SO_2-Eq.]	1.27E-01	2.02E-04	1.34E-05	2.21E-03	2.02E-04	1.00E-04	4.17E-05	-4.78E-02
EP	Eutrophication potential	[kg $(PO_4)^{3-}$- Eq.]	8.57E-03	4.45E-05	2.34E-06	1.24E-04	4.45E-05	5.63E-06	4.74E-06	-2.77E-03
POCP	Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	8.27E-03	-6.13E-05	9.51E-07	1.31E-04	-6.13E-05	5.94E-06	2.62E-06	-3.12E-03
ADPE	Abiotic depletion potential for non fossil resources	[kg Sb Eq.]	3.30E-03	1.88E-09	1.06E-09	6.48E-08	1.88E-09	2.94E-09	1.13E-08	-2.86E-03
ADPF	Abiotic depletion potential for fossil resources	[MJ]	2.37E+02	6.10E-01	1.65E-02	5.32E+00	6.10E-01	2.41E-01	7.31E-02	-7.47E+01

RESULTS OF THE LCA - RESOURCE USE: One piece of SMARTair Escutcheon

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	2.47E+01	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	2.47E+01	2.97E-02	1.54E-03	1.52E+00	2.97E-02	6.90E-02	6.24E-03	-6.94E+00
PENRE	Non renewable primary energy as energy carrier	[MJ]	2.71E+02	-	-	-	-	-	-	-
PENRM	Non renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PENRT	Total use of non renewable primary energy resources	[MJ]	2.71E+02	6.25E-01	1.93E-02	8.33E+00	6.25E-01	3.77E-01	8.09E-02	-8.09E+01
SM	Use of secondary material	[kg]	5.33E-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]	1.29E-01	3.25E-05	1.71E-04	3.76E-03	3.25E-05	1.70E-04	2.53E-04	-3.74E-02

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of SMARTair Escutcheon

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	1.62E-02	6.32E-06	1.33E-06	1.15E-03	6.32E-06	5.23E-05	6.40E-06	-2.54E-03
NHWD	Non hazardous waste disposed	[kg]	1.47E+00	8.57E-05	1.48E-03	2.69E-03	8.57E-05	1.22E-04	1.23E-01	-5.15E-01
RWD	Radioactive waste disposed	[kg]	1.37E-02	5.95E-06	1.13E-06	1.20E-03	5.95E-06	5.44E-05	3.07E-06	-2.50E-03
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	6.90E-03	0.00E+00	0.00E+00	1.59E+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	7.43E-02	0.00E+00	0.00E+00	0.00E+00	1.96E-01	-
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	2.10E-01	0.00E+00	0.00E+00	0.00E+00	5.37E-01	-

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 phase (modules A1-A3) contributes between 93% and 100% to the overall results for all the environmental impact assessment categories hereby considered. Within the production phase, 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 phase (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 phase, 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, PE INTERNATIONAL 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, PE INTERNATIONAL AG, 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	X	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece of SMARTair Escutcheon

Parameter	Parameter	Unit	A1-3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	1.97E+01	4.41E-02	5.88E-02	4.68E-01	4.41E-02	2.12E-02	1.16E-01	-6.54E+00
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	4.76E-09	1.69E-12	2.86E-13	3.41E-10	1.69E-12	1.54E-11	3.87E-13	-4.35E-10
AP	Acidification potential of land and water	[kg SO_2-Eq.]	1.24E-01	2.61E-04	1.62E-05	2.09E-03	2.61E-04	9.47E-05	4.88E-05	-4.58E-02
EP	Eutrophication potential	[kg N-eq.]	5.26E-03	1.82E-05	9.36E-07	8.90E-05	1.82E-05	4.03E-06	2.49E-06	-1.40E-03
Smog	Ground-level smog formation potential	[kg O_3-eq.]	1.47E+00	5.26E-03	3.79E-04	1.89E-02	5.26E-03	8.57E-04	6.98E-04	-4.95E-01
Resources	Resources – fossil resources	[MJ]	2.02E+01	8.61E-02	1.93E-03	3.79E-01	8.61E-02	1.72E-02	7.94E-03	-4.33E+00

RESULTS OF THE LCA - RESOURCE USE: One piece of SMARTair Escutcheon

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	2.47E+01	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	2.47E+01	2.97E-02	1.54E-03	1.52E+00	2.97E-02	6.90E-02	6.24E-03	-6.94E+00
PENRE	Non renewable primary energy as energy carrier	[MJ]	2.71E+02	-	-	-	-	-	-	-
PENRM	Non renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PENRT	Total use of non renewable primary energy resources	[MJ]	2.71E+02	6.25E-01	1.93E-02	8.33E+00	6.25E-01	3.77E-01	8.09E-02	-8.09E+01
SM	Use of secondary material	[kg]	5.33E-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]	1.29E-01	3.25E-05	1.71E-04	3.76E-03	3.25E-05	1.70E-04	2.53E-04	-3.74E-02

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of SMARTair Escutcheon

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	1.62E-02	6.32E-06	1.33E-06	1.15E-03	6.32E-06	5.23E-05	6.40E-06	-2.54E-03
NHWD	Non hazardous waste disposed	[kg]	1.47E+00	8.57E-05	1.48E-03	2.69E-03	8.57E-05	1.22E-04	1.23E-01	-5.15E-01
RWD	Radioactive waste disposed	[kg]	1.37E-02	5.95E-06	1.13E-06	1.20E-03	5.95E-06	5.44E-05	3.07E-06	-2.50E-03
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	6.90E-03	0.00E+00	0.00E+00	1.59E+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	7.43E-02	0.00E+00	0.00E+00	0.00E+00	1.96E-01	-
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	2.10E-01	0.00E+00	0.00E+00	0.00E+00	5.37E-01	-

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