ENVIRONMENTAL PRODUCT DECLARATION

SARGENT

80 SERIES MECHANICAL PANIC EXIT DEVICE



A slight individual or collective push on the activating bar, which is perpendicular to the door, triggers the opening of the Emergency Exit.

SARGENT ASSA ABLOY

ASSA ABLOY is committed to providing products and services that are environmentally sound throughout the entire production process and the product lifecycle. Our unconditional aim is to make sustainability a central part of our business philosophy and culture, but even more important is the job of integrating sustainability into our business strategy. The employment of EPDs will help architects, designers and LEED-APs select environmentally preferable door openings. The SARGENT 80 Series Mechanical Panic Exit Device EPD provides detailed requirements with which to evaluate the environmental and human health impacts related to producing our door openings. ASSA ABLOY will continue our efforts to protect the environment and health of our customers/end users and will utilize the EPD as one means to document those efforts.





ENVIRONMENTAL PRODUCT DECLARATION

SARGENT

ASSA ABLOY

SARGENT Manufacturing Company 80 Series Mechanical Panic Exit Device According to EN 15804 and ISO 14025 Dual Recognition by UL Environment and Institut Bauen und Umwelt e.V.

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. Accuracy of Results: EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.



PROGRAM OPERATOR	UL Environment		
DECLARATION HOLDER	SARGENT Manufacturing Company an ASSA ABLOY Group Company		
ULE DECLARATION NUMBER	4786545067.131.1		
IBU DECLRATION NUMBER	EPD-ASA-20150141-IBA1-EN		
DECLARED PRODUCT	80 Series Electromechanical Exit	Device	
REFERENCE PCR	IBU: PCR Locks and fittings (mecl 2014	nanical & electromechanical locks & fittings), 07-	
DATE OF ISSUE	May 18, 2015		
PERIOD OF VALIDITY	5 years		
. 2.1.02	O yours		
CONTENTS OF THE DECLARATION	General information Product / Product description LCA calculation rules LCA scenarios and further technic LCA results References	al information	
The PCR review was conducted	by:	IBU – Institut Bauen und Umwelt e.V. PCR was approved by the Independent Expert Committee (SVA)	
The CEN Norm EN 15804 serves was independently verified in acc Underwriters Laboratories	as the core PCR. This declaration ordance with ISO 14025 by	ubl	
☐ INTERNAL		Wade Stout	
This life cycle assessment was in with EN 15804 and the reference	dependently verified in accordance PCR by:	IBU - Institut Bauen und Umwelt e.V.	





1. General Information

SARGENT Manufacturing Company

Programme holder

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

Declaration number

EPD-ASA-20150141-IBA1-EN

This Declaration is based on the Product Category Rules:

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

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Muanin

Issue date

18.05.2015

Valid to

17.05.2020

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

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

80 Series Electromechanical Exit Device

Owner of the Declaration

SARGENT Manufacturing Company 100 Sargent Drive, New Haven, CT 06511 USA

Declared product / Declared unit

The declaration represents 1 electromechanical panic exit device — 80 series electromechanical Exit consisting of the following items: rim exit device with electric latch retraction and lever trim

Scope:

This EPD is based on the full lifecycle of 1 SARGENT 80 series electromechanical rim panic device. Data was collected from the exit device manufacturer in New Haven, Connecticut (US). 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 SVA)

2. Product

2.1 Product description

Product name: 80 series electromechanical **Product characteristic:** electromechanical panic exit device

A slight individual or collective push on the activating bar, which is perpendicular to the door, triggers the opening of the Emergency Exit, in any circumstances. SARGENT 80 Series exits are available in multiple locking arrangements including Rim, Mortise Surface Vertical Rod, and Concealed Vertical rod with narrow and wide stile options in both panic and fire rated versions.

The 80 series rim device is available in 4 standard lengths, with multiple mechanical and electrified options for both exit and trim.

2.2 Application

In compliance with security regulations against fire in public places (art. C045) designed to equip:

- Emergency exit doors
- Frequently used communicating doors
- Types of doors
- Metal or wooden doors
- Metal, aluminum or PVC framed doors with a narrow stile
- Single or double leaf doors (separate or with rebated edge)
- Designed for all types of public, particularly children, the elderly and the disabled.

2.3 Technical Data

The table presents the technical properties of Electromechanical panic exit devices – SARGENT 80 Series:

Technical data

Parameter	Value
Door types	Door types Wood or metal 1-3/4" (44 mm) minimum thickness standard

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	Doors thickness 1-3/4" to 2-1/4" optional
Rail size	Rails are available in 4 sizes, use door width to determine size needed.
	 E Rail for 24" to 32" door widths, No cutting required for 32" door F Rail for 33" to 36" door widths, No cutting required for 36" door J Rail for 37" to 42" door widths, No cutting required for 42" door G Rail for 43" to 48" door widths, No cutting required for 48" door
Center Case Dimensions	8- 3/8" (213 mm) x 2- 5/8" (67 mm)
Projection	Pushbar Neutral – 3" (76 mm) Pushbar Depressed – 2- 1/8" (54 mm)
Device centerline from finished floor	Device Centerline from 41" (1041 mm) for Standard Applications Finished Floor

2.4 Placing on the market / Application rules

The products are subject to UL marking. Relevant norms are:

ANSI/BHMA A156.3 American Standard for Exit Devices.

2.5 Delivery status

Delivered as a complete unit, inclusive of exit device, trim, strike and fasteners. Delivered in a box size 38.5" x 7.5" x6" (978 x 191 x 152mm).

2.6 Base materials / Ancillary materials

The average composition for 80 series electromechanical is as following:

Component	Percentage in mass (%)
Brass	18.00
Stainless Steel	45.40
Steel	13.52
Zinc	16.00
Electro mechanics	4.67
Plastics	1.95
Other	0.46
Total 100.0	

2.7 Manufacture

Products are manufactured and assembled in the United States and are supported by tier-1 supplier in Mexico. Electronics are produced in Asia. The components come from processes such as stamped steel, zinc and steel casting.

2.8 Environment and health during manufacturing

ASSA ABLOY is committed to integrating our sustainability efforts across the organization. Our priorities are to: reduce resource and energy consumption; reduce carbon emissions; improve water and waste management; improve health and safety performance in operations; improve sustainability performance within our supply chain and enhance the sustainability performance in ASSA ABLOY's supply of

door opening solutions. Inspections, audits, and reviews are conducted periodically to ensure that applicable standards are met and environmental management systems are evaluated.

Our Code of Conduct covers business ethics, workers'

Our Code of Conduct covers business ethics, workers' rights, human rights, environment and health & safety, consumer interests and community outreach. It provides the framework for ASSA ABLOY's daily operations.

- Sargent Manufacturing is in the process of certification of both ISO 9001:2008 and ISO 14001:2004, expected certification date 1/2015
- Any waste metals during machining are separated and recycled. The waste water is delivered to waste treatment plant.

2.9 Product processing/Installation

SARGENT 80 Series Exit Devices are distributed through, and installed by trained technicians, such as locksmiths or security technicians. Preparation of doors and frames are conducted at the door manufacturer's production site.

2.10 Packaging

80 series electromechanical panic exit devices are packed in a cardboard box with corrugated carton inlays. The packaging is fully recyclable.

Material	Value (%)
Cardboard/paper	99.7
Plastic	0.3
Total	100.0

2.11 Condition of use

Exit device requires no maintenance.

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

The reference service life of 30 years is based on a typical installation of a SARGENT 80 Series Exit Device, operated when the facilities are to be closed or opened. If operations per day exceeds that typical wear the locks are exposed to the life time is limited to 500,000 cycles in accordance with ANSI/BHMA A156.3.

Influences on ageing when applied in accordance with the rules of technology.

2.14 Extraordinary effects

Suitable for use in fire and smoke doors (listed by Underwriters Laboratories).

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. The majority, of components is stainless steel, steel, brass and zinc, which can be recycled. The locks can be mechanically dissembled to separate the different materials. The plastic components can be used for energy recovery in an incineration plant.

2.16 Disposal

The product can be mechanically dissembled to separate the different materials. 99.63% of the

materials used are recyclable. The rest is disposed as a construction waste for landfill.

2.17 Further information

SARGENT Manufacturing Company 100 Sargent Drive, New Haven, CT 06511 USA Tel 800-727-5477 www.sargentlock.com

3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of SARGENT 80 Series electromechanical panic exit device as specified in Part B requirements on the EPD for PCR Locks and fittings: (mechanical & electromechanical locks & fittings).

Declared unit

200.0.00				
Name	Value	Unit		
Declared unit	1	1 piece of electrified panic exit device		
Mass (without packaging)	6.96	kg		
Conversion factor to 1 kg	0.144	-		

3.2 System boundary

Type of the EPD: cradle to gate - with Options The following life cycle phases 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

The use stage:

- B2 Maintenance (cleaning of the exit device)
- B6 Operational energy use

End-of-life stage:

- C2 Transport to 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 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 United States of America, thus an US 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 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

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)	1.62	kg
Output substances following waste treatment on site (Plastic packaging)	0.01	kg

Maintenance (B2)

Name	Value	Unit
Other resources – detergents	0.1	kg/a
Water for cleaning	0.1	kg/a

Reference service life

Name	Value	Unit
Reference service life	30	а

Operational energy use (B6)

Name	Value	Unit
Electricity consumption	8.4	kWh
Days per year in use	365	d
Hours per day in on mode	0.04	h
Power consumption in on mode in W	18.48	W

End of life (C1-C4)

Name	Value	Unit
Collected separately Brass, stainless		
steel, steel. zinc, electro mechanics,	6.96	kg
plastics		
Collected as mixed construction waste	0.03	kg
 construction waste for landfilling 	0.03	
Reuse Plastics	0.14	kg
Recycling Brass, stainless steel, steel.	6.82	kg
zinc, electro mechanics	0.02	ĸg
Landfilling - Construction waste for	0.14	ka
landfilling	0.14	kg

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

Name	Value	Unit
Collected separately waste type	8.59	l.a
(including packaging)	0.59	kg
Recycling Brass	14.59	%
Recycling Steel	11.95	%
Recycling Stainless steel	36.80	%
Recycling Zinc	12.97	%
Recycling Electro mechanics	3.78	%
Reuse Plastics	1.60	%
Reuse Paper packaging (from A5)	18.88	%
Reuse Plastic packaging (from A5)	0.06	%
Loss Construction waste for landfilling (no recycling potential)	0.37	%



5. LCA: Results

Results shown below were calculated using CML 2001 – Apr. 2013 Methodology.

DESC	CRIP	TION O	F THE	SYST	EM E	BOUNE	ARY (X =	INCLU	DED IN	LCA; I	MND =	= MOD	ULE N	OT DE	CL/	ARED)
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A 1	A2	A3	A4	A5	B1	B2	В3	B4	4 B5	B6	B7	C1	C2	C3	C4		D
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PER PER PENF PENF SMM RSF NRS	E M M CT RE RRM RT I I I I I I I I I I I I I I I I I I	Renewate Ren	Parame Parame De prima De pr	A - RES ary energy arrier ary energy arrier ary energy arrier burces imary en carrier imary en tillization a renewat ary materi e second ishe second ish water	y as gy gy gy gy ation mary eergy eergy oble asial ary mdary	Multi [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1 - A3 1.22E+(0.00E+(1.22E+(0.00E+(8.95E+(0.00E+(0.00E+(0.00E+(0.00E+(3.75E-(000 000 000 000 000 000 000 000 000 00		80 Serie A5 - 6.05E-02 - 7.61E-01 0.00E+00 0.00E+00 6.72E-03	6.26E 0 0.00E 0 0.00E 3 6.30E	+02 6.3 +01 8.2 +00 0.0 +00 0.0 -02 2.3	B6	C2 1.11E-01 2.83E+00 0.00E+00 0.00E+00 0.00E+00 7.84E-05	1.09E 1.09E 1.09E 1.00E 1.00E 1.00E 1.00E	E-02 E-01 E+00 E+00 E-04	D -2.52E+011.42E+02 0.00E+00 0.00E+00 -1.04E-01 D
PERPENSION NRS FW RESULE LECTURE Parameter HW	M M CT	Renewat Renewa	Parame Parame Ole prima ole prima able prim a as mate of renew ergy res wable pri a energy is wable pri a energy is se of non y energy seconda enewable fuels n renewa fuels of net fre cal Exi Paramete us waste	ary energy arrier ary energy e	y as gy y as gy y atation nary ergy ergy ole ess ala arry ndary TPUT ce Ui	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1 - A3 23E-02 A1 - A3	900 000 000 000 000 000 000 000 000 000		80 Serie A5 6.05E-02 - 7.61E-01 0.00E+00 0.00E+00 6.72E-03 CATEGO A5 5.23E-05	6.26E 0 0.00E 0 0.00E 0 0.00E 0 3.67E-0 3.67E-0	+02 6.3 +01 8.2 +00 0.6 +00 0.6 +00 0.6 -02 2.1 : One	B6	C2 1.11E-01 - 2.83E+0C 0.00E+0C 0.00E+0C 7.84E-05 C2 C2 6.44E-06	1.09E 1.09E 1.00E 1.00E 1.1.16E	E-02 E-01 E+00 E+00 E-04	D
PER PENF PENF SM RSF FW RESU Electr	EE M M ET STEEL ST	Renewate Ren	Parame De prima De pr	eter A - RES ary energy arrier ary energy arrier ariel utiliz wable printer ources imary energy imary en carrier	gy as gy y as gy y attion mary ergy ergy ergy modary modary to get y y as given by the graph of	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	1.22E+(0.00E+(1.22E+(8.95E+(0.00E+(6.68E+(0.00E+(3.75E-0 VS ANI 41 - A3 23E-02 45E+00	900 000 000 000 000 000 000 000 000 000		80 Serie A5 - 6.05E-02 - 7.61E-01 0.00E+00 0.00E+00 6.72E-03 CATEGO A5 5.23E-05 5.90E-02	ES Electric B2	+02 6.3 +01 8.2 +00 0.0 +00 0.0 +00 0.0 -02 2.3 : One	27E+01 00E+00 00E+00 01E-02 piece 86 4E-05	C2 1.11E-01 - 2.83E+00 0.00E+00 0.00E+00 7.84E-05 c1 6.44E-06 3.56E-04	1.09E 1.09E 1.09E 1.09E 1.09E 1.09E 1.16E 1.16E 3.29E	E-01 E+00 E+00 E-04	D -2.52E+011.42E+02 0.00E+00 0.00E+00 0.00E+01 D -1.01E-02 -1.10E+00
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PER PENF PENF SM RSF FW RESU Electr	E M M CT	Renewate en Renewa	Parame De prima De pr	A - RES A - RES Ary energy arrier ary energy arrier ary energy arrier ary energy arrier bources imary en carrier imary	y as gy y as gy y attion mary ergy ergy ble ess ala arry mdary TPUT ce Ui k [k k k k k k k k k k k k	Mark	1.22E+(0.00E+(1.22E+(8.95E+(0.00E+(6.68E+(0.00E+(3.75E-0 VS ANI 41 - A3 23E-02 45E+00	e pide e		80 Serie A5 - 6.05E-02 - 7.61E-01 0.00E+00 0.00E+00 6.72E-03 CATEGO A5 5.23E-05 5.90E-02	6.26E 0 0.00E 0 0.00E 3 6.30E 0 1.40E-(0.00E+)	+02 6.3 +01 8.2 +00 0.6 +00 0.6 +00 0.6 -02 2.3 : One	B6	C2 1.11E-01 - 2.83E+00 0.00E+00 0.00E+00 7.84E-05 c1 6.44E-06 3.56E-04	1.09E 1.09E 1.09E 1.09E 1.09E 1.09E 1.16E 1.16E 3.29E	E-02 E-01 E+00 E+00 E-04 E-04	D -2.52E+011.42E+02 0.00E+00 0.00E+00 0.00E+01 D -1.01E-02 -1.10E+00
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PERIOR PENERS PE	E E M M ST T ST S	Renewate Ren	Parame De prima anergy ca able prima anergy ca as mate of renevery reservable prima anergy ca and anergy an	esses A - RES ary energy arrier ary energy arrier arial utiliz vable prinources imary energy imary en arial utiliz vable prinources imary en arrier imary en	y as gy y as gy y as gy y attion mary ergy ergy ergy to le ess ial ary ndary TPUT CCC U i k k k k k k k k k k k k k k k k k	MJ	A1 - A3 23E-02 45E+00 000E+0 0.00E+0	e pid 3		80 Serie A5 - 6.05E-02 - 7.61E-01 0.00E+00 0.00E+00 6.72E-03 CATEGO A5 5.23E-05 5.90E-02 4.44E-05 0.00E+00 1.48E+00	6.26E 0 0.00E 0 0.00E 0 0.00E 0 1.40E-(0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+	+02 6.5 +01 8.2 +00 0.6 +00 0.6 +00 0.6 -02 2.9 : One	B6	C2 1.11E-01 - 2.83E+00 0.00E+00 0.00E+00 0.00E+06 0.00E+06 3.56E-04 3.70E-06 0.00E+00 0.00E+00	1.09E 1.16E 1.16E 3.29E 6.61E 0.00E 0.00E 0.00E 6.675E	E-02 E-01 E+00 E+00 E-04 -05 -02 -06 +00 +00 -01	D -2.52E+011.42E+02 0.00E+00 0.00E+00 -1.04E-01 D -1.01E-02 -1.10E+00 -9.87E-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 phase (modules A1-A3) contributes between 84% and 99% to the overall results for all the environmental impact assessment categories hereby considered, except for the eutrophication potential (EP), for which the contribution from the production phase accounts for app. 40%. 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. 76% 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.

Relatively high impact on EP (57%) during the maintenance phase (module B2) is a result of generated waste water during maintenance of the product. Eutrophication is the enrichment of nutrients in a certain place and it can be aquatic or terrestrial. Waste water contributes to eutrophication therefore, as expected, it is mainly related with the maintenance of the product (B2).

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., 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

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

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)

ANSI/BHMA A156.3-2008 Exit Devices

Standard ANSI/BHMA A156.3-2008 establishes requirements for exit devices and trim, automatic and self-latching flush bolts, removable mullions, coordinators, and carry-open bars. Functions and types are described and numbered.

A117.1 Accessibility Code

Standard for Accessible and Usable Buildings and Facilities as mandated by law and incorporated by reference by the States and Municipalities, including Ohio in the Ohio Administrative Code 4401:8-44-01.

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

UL and ULc Standards

ULC Standards develops and publishes standards and specifications for products having a bearing on fire, life safety and security, crime prevention, energy efficiency, environmental safety, security of assets and facilities, live working and workplace safety and other areas. ULC Standards is accredited by the Standards Council of Canada as a consensus based Standards Development Organization under the National Standards System of Canada.



9. Annex

Results shown below were calculated using TRACI Methodology.

DESC	CRIP	TION O	F THE	SYST	ЕМ В	DUND	ARY (2	K = I	NCLU	DED IN I	LCA;	MNE	O = MOE	ULE N	OT DE	ECL/	ARED)
PRODUCT STAGE		STAGE	CONSTRUCTI			EM BOUNDARY (X = INCLUDED IN LCA; USE STAGE								END OF LIFE STAGE			
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	Waste processing	Disposal	Reuse-	Recovery- Recycling- potential
A1	A2	A3	A4	A5	B1	B2	В3	В4	B5	В6	B7	C,	1 C2	C3	C4		D
Х	Χ	Х	Х	Х	MND	Χ	MND	MNE	O MNE) MND	MND	MN	ID X	MND	Х		Х
RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece of 80 Series Electromechanical Exit																	
Devic	Device																
Parame	eter	Pa	Parameter		U	Unit			A4	A5	B2	:	B6	C2	C	:4	D
GWF	>	Global w	warming potential [F		[kg C0	D ₂ -Eq.]	6.18E+0	1 2.	45E-01	2.31E+00	-2.06E	+00	5.67E+00	2.04E-0	1 3.53	E-01	-9.85E+00
ODF	,				[kg C	[kg CFC11- Eq.]		8 1.:	25E-12	1.12E-11	7.23E	-11	2.08E-09	1.04E-1	2 1.13	E-12	-1.74E-09
AP	AP Acidificati		ion potential of land		1	O ₂ -Eq.]	2.87E-0	1 1.4	47E-03	6.39E-04	5.67E	-02	1.79E-02	1.22E-0	3 1.05	E-04	-5.55E-02
EP			and water		[ka N	N-eq.]	1.39E-0	2 1.0	04E-04	3.67E-05	4.48E	-02	8.79E-04	8.63E-0	5 3.21	E-06	-1.82E-03
Smo	Groun		and lovel amon formation				3.03E+0		02E-02	1.48E-02	2.40E		1.52E-01	2.51E-0	-	E-04	-5.55E-01
	_	potential							87E-01								
RESU		OF TH							7.61E-02	7.67E		3.85E+00	4.05E-0		E-02	-9.65E+00	
				7 - KE:	SOLIR	:F 119	F. One	nie	ce of	80 Serie	s Flag	tro	mechan	ical Ex	it Dev	ice	
Param	neter				SOUR					80 Serie							D
			Parar	meter		Uni	t A1	- A3	A4	80 Serie A5		B2	mechan B6	ical Ex		ice C4	D
Param PEF		Renew	Parar rable prir energy	meter mary ene carrier	ergy as		t A1										D -
	RE	Renew	Parar vable prir energy wable pr	meter mary ene carrier rimary er	ergy as nergy	Uni	t A1	- A3				B2					D -
PEF	RE RM	Renew Rene resource	Parar rable prir energy wable prir es as ma	meter mary ene carrier	ergy as nergy ilization	Uni [MJ]	1.22 0.00	- A3 E+02 E+00	- -	A5 -		B2 - -	B6 -	C2 -		C4 - -	-
PEF	RE RM	Renew Rene resourc Total us	Parar vable primergy wable press as masse of renergy re	meter mary ene carrier rimary er aterial ut ewable p	nergy as nergy illization orimary	Unit	1.22 0.00	- A3 E+02	- -	A5 -		B2 - -		C2 -		C4 - -	-
PEF	RE RM RT	Renew Rene resourc	Parar vable primergy wable press as masse of renergy re	meter mary ener carrier rimary er aterial ut lewable persources orimary e	nergy as nergy illization orimary	Unit	1.22 0.00 1.22	- A3 E+02 E+00	- -	A5 -		B2 - -	B6 -	C2 -		C4 - -	-
PEF PEF	RE RM RT	Renew Rene resource Total us Non rene	Parar rable prir energy wable pries as ma se of ren energy re- ewable p energy ewable p	mary ener carrier rimary er aterial ut ewable pesources rimary er carrier	ergy as hergy ilization primary nergy as	Unii [MJ] [MJ] [MJ]	1.22 0.00 1.22 8.95	E+02 E+02 E+02	- -	A5 -		B2 - -	B6 -	C2 -		C4 - -	- -2.52E+01
PEF PEF PEN PEN	RE RM RT IRE	Renew Rene resource Total us Ron rene	Parar rable prir energy wable pries as ma se of renenergy re ewable p energy ewable p naterial	mary ene carrier rimary er aterial ut lewable pesources rrimary e carrier rrimary e	ergy as nergy ilization primary s nergy as	[LM] [LM] [LM] [LM] [LM] [LM]	A1 1.22 0.00 1.22 8.95 0.00	E+02 E+02 E+02 E+02 E+02	1.33E-0		02 1.18	B2 BE+02 -	B6	- C2	01 1.09	C4 - - 9E-02 -	- -2.52E+01
PEF PEF PEN PEN	RE RM RT IRE RM	Renew Rene resourc Total us Ron rene Non rene Total prima	Parar rable prir energy wable pries as ma se of ren energy re ewable p energy ewable p material use of n ary ener	mary energiant of the control of the	ergy as nergy ilization orimary nergy as nergy as nergy as nergy as	Unii [MJ] [MM] [LM] [LM] [LM] [LM] [LM]	A1 1.22 0.00 1.22 8.95 0.00 8.95	E+02 E+02 E+02 E+02 E+02 E+00	1.33E-(- - 3.39E+		02 1.18	B2 - - BE+02 - -	B6	C2 0 1.11E 1 2.83E+	01 1.09	C4 - - 9E-02 - - - 6E-01	- -2.52E+01 - - -1.42E+02
PEF PEF PEN PEN	RE RM RT IRE RM IRT	Renew Rene resourc Total us Ron rene Non rene Total prima	Parar rable prir energy wable pries as ma se of ren energy re ewable p energy ewable p material use of n ary ener	mary energiant carrier rimary energiaterial ut lewable pesources rimary e carrier rimary e utilization on renevergy resoundary mar	ergy as nergy ilization orimary nergy as nergy as nergy as nergy as to wable trees terial	Unit [MJ]	t A1 1.22 0.00 1.22 8.95 0.00 8.95 6.68	E+02 E+02 E+02 E+02 E+02 E+00 E+02	1.33E-(- - 3.39E+)		02 1.18 01 6.26 00 0.00	B2 - - BE+02 - - - DE+00	B6	C2 0 1.11E 1 2.83E+ 0 0.00E+	01 1.09	- 9E-02 - - 6E-01	- -2.52E+01
PEF PEF PEN PEN PEN SM	RE RM IRT W	Renew Rene resource Total us Ron rene Non rene Total prim:	Parar vable prir energy wable pes as masse of renergy re- ewable penergy re- ewable penaterial in use of no ary ener- of secon- enewable	mary energy ener	ergy as hergy illization primary s hergy as hergy as hergy as hergy as terial ary fuels	Unit [MJ]	A1 1.22 0.00 1.22 8.95 0.00 8.95 6.68 0.00	E+02 E+02 E+02 E+02 E+02 E+00 E+00 E+00	1.33E-(- - 3.39E+) 0.00E+)		02 1.18 01 6.26 00 0.00 00 0.00	BE+02	B6	C2	01 1.09 00 1.60 00 0.00 00 0.00	- - - - - - 6E-01 0E+00	-2.52E+01 -2.52E+01 1.42E+02 0.00E+00
PEF PEF PEN PEN PEN RS	RE RM RT IRE RM IRT W SF	Renew Rene resourc Total us Ron rene Non rene Total prim Use of Use of n	Parar vable prir energy wable pes as ma se of renergy re ewable penergy ewable penergy wable ponaterial use of nary ener of secon enewable on renevable	mary energy ener	ergy as hergy ilization orimary inergy as hergy as hergy as hergy as terial ary fuels condary	Unit [MJ]	A1 1.22 0.00 1.22 8.95 0.00 8.95 6.68 0.00 0.00 0.00 0.00	E+02 E+02 E+02 E+02 E+02 E+00 E+00 E+00	1.33E-0 1.33E-0 3.39E+1 0.00E+1 0.00E+1		01 6.26 00 0.00 00 0.00 00 0.00	BE+02	B6	C2	00 1.60 00 0.00 00 0.00 00 0.00		-2.52E+01 -1.42E+02 0.00E+00 0.00E+00
PEF PEN PEN PEN RS NRS	RRE RRM RRM RRT RRM RRT RRM RRT RRM RRT RRT	Renew Rene resourc Total us Ron rene Non rene Total prim Use of re Use of n	Parar vable prir energy wable p es as ma se of ren energy re ewable p energy ewable p naterial i use of n ary ener of secon enewable on renev fue e of net	mary energy ener	ergy as nergy ilization orimary inergy as nergy as nergy as nergy as terial ary fuels condary ter	[MJ] [MJ]	A1 1.22 0.00 1.22 8.95 0.00 8.95 0.00 0.00 0.00 0.00 0.00 0.3.75	E+02 E+02 E+02 E+02 E+00 E+02 E+00 E+00	1.33E-(- - 3.39E+(0.00E+(0.00E+(9.41E-(02 1.18 01 6.26 00 0.00 00 0.00 00 0.00 00 0.33 6.36	BE+02	B6	C2	01 1.09 00 1.60 00 0.00 00 0.00 00 0.00 00 0.00	C4	-2.52E+01 -1.42E+02 0.00E+00 0.00E+00
PEF PEN PEN PEN RS NRS	RRE RM IRT WILTS	Renew Rene resourc Total us Ron rene Non rene Total prims Use of re Use of n	Parar vable pring energy wable press as masse of renergy rewable preservable pressured in the pressure of the	mary energy ener	ergy as nergy ilization orimary inergy as nergy as nergy as nergy as terial ary fuels condary ter	[MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1 1.22 0.00 1.22 8.95 0.00 8.95 6.68 0.00 0.00 3.75 VS ANI	E+02 E+02 E+02 E+02 E+02 E+02 E+00 E+00	1.33E-(- - 3.39E+(0.00E+(0.00E+(9.41E-(ASTE (A5	01 6.26 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00	BE+02	B6	C2	00 1.60 00 0.00 00 0.00 00 0.00 00 0.00 05 8.63 Series	C4	-2.52E+01 -1.42E+02 0.00E+00 0.00E+00 -1.04E-01
PEF PEN PEN PEN SM RS NRS FV RESU Electt	RRE RRM RT RE RM W GF SSF VV V ULTS rome	Renew Rene resourc Total us Non rene n Total prima Use of re Use of n Us OF TH	Parar rable prir energy wable prir es as ma se of ren energy re ewable p energy ewable p material r use of n ary ener of secon enewable on rener e of net IE LCA Cal Exi	mary energy ener	ergy as mergy illization orimary nergy as nergy as nergy as nergy as roes terial ary fuels condary ter TPUT ce	[MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1 1.22 0.00 1.22 8.95 0.00 8.95 0.00 0.00 0.00 3.75 VS ANI	E+02 E+02 E+02 E+02 E+02 E+02 E+00 E+00	1.33E-0 1.33E-0 3.39E+1 0.00E+1 0.00E+1 9.41E-0 AASTE (A5	02 1.18 01 6.26 00 0.00 00 0.00 00 0.00 00 0.00 00 DRIES	BE + 02	B6	C2 0 1.11E 1 2.83E+ 0 0.00E+ 0 0.00E+ 0 0.00E+ 2 7.84E- 3 of 80 \$	01 1.09 00 1.60 00 0.00 00 0.00 00 0.00 05 8.63 Series	CC4	-2.52E+01 -2.52E+01 -1.42E+02 0.00E+00 0.00E+00 -1.04E-01
PEF PEN PEN PEN SM RS NRS FV	RRE RRM RT RE RM W BF SSF V V ULTS rome	Renew Rene resourc Total us Non rene Total prima Use of Use of n Us OF TH echanic	Parar vable pring energy researches as masses of renergy researches as masses of renergy researches as masses of renergy researches ary energy ewable properties on renewable on renewable on renewable and renewable renewable on renewable	mary energy ener	ergy as mergy illization orimary inergy as mergy	[MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1 1.22 0.00 1.22 8.95 0.00 8.95 6.68 0.00 0.00 3.75 VS ANI	E+02 E+02 E+02 E+02 E+02 E+02 E+00 E+00	1.33E-(- - 3.39E+(0.00E+(0.00E+(9.41E-(ASTE (A5	01 6.26 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00	BE+02	B6	C2 0 1.11E 1 2.83E+ 0 0.00E+ 0 0.00E+ 0 0.00E+ 2 7.84E- 3 0f 80 \$ C2 6.44E-0	01 1.09 00 1.60 00 0.00 00 0.00 00 0.00 05 8.60 Series	C4	-2.52E+01 -1.42E+02 0.00E+00 0.00E+00 0.00E+00 -1.04E-01
PEF PEN PEN PEN SM RS FV RESU Electr Param	RRE RRM RRE RRM RRF RM RFF RM VV VV D D D VVD	Renew Rene resourc Total us Non rene Total prima Use of re Use of n Use of TH echanic	Parar rable prir energy wable prir es as ma se of ren energy re ewable p energy ewable p material u use of n ary ener of secon enewable on reneu e of net IE LCA Paran rdous wa zardous wa zardous	mary energy ener	ergy as nergy illization orimary s nergy as nergy as nergy as nergy as vable rces terial ary fuels condary ter TPUT ce	[MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	1.22 0.00 1.22 8.95 0.00 8.95 0.00 0.00 3.75 VS ANI	E+02 E+00 E+02 E+00 E+02 E+00 E+00 E+00	1.33E-(- 1.33E+(- 3.39E+(0.00E+(0.	A5	01 6.26 00 0.00 00 0.00 00 0.00 03 6.3 00 0.00 03 6.3 00 0.00 04 0.00 05 0.00 06 0.00 07 0.00 08 0.00 08 0.00 09 0.00 00 00 0.00 00 00 0.00 00 00 0.00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	BE+02	B6	C2 0 1.11E 1 2.83E+ 0 0.00E+ 0 0.00E+ 0 0.00E+ 2 7.84E- 3 0f 80 \$ C2 6.44E-0 3.56E-0	00 1.60 00 0.00 00 0.00 00 0.00 05 8.60 Series	C4	
PER PEN PEN PEN SM RS NRS FV RESU Electt Param HW NHW RW CRI	RRE RRM RT RT RT RF RM RT VV VD D U	Renew Rene resourc Total us Non rene n Total prima Use of re Use of n Use of n Hazar Non haz Radioa Con	Parar rable prir energy wable prir es as ma se of ren energy re ewable p energy ewable p material r use of n ary ener of secon enewable on rener e of net Paran rdous wa erardous active wa nponents	mary energy ener	ergy as mergy illization orimary s mergy as merg	[MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	1.22 0.00 1.22 8.95 0.00 8.95 0.00 0.00 3.75 VS ANI A1 - A3 3.23E-0 6.45E+0 5.30E-0 0.00E+0	E+02 E+02 E+02 E+02 E+02 E+00 E+02 E+00 E+00	1.33E-0 1.33E-0 1.33E-0 3.39E+1 0.00E+1 0.00E+1 0.00E+1 4.5TE (A4 73E-06 27E-04 44E-06 00E+00	A5	02 1.18 01 6.26 00 0.00 00 0.00 00 0.00 03 6.30 DRIES B2 3.67E 4.37E 1.40E 0.00E	BE+02	B6	C2 - 0 1.11E 1 2.83E+ 0 0.00E+ 0 0.00E+ 0 0.00E+ 0 6.44E-0 3.56E-0 3.70E-0 0.00E+0	00 1.60 00 0.00 00 0.00 00 0.00 00 0.00 05 8.63 Series 0 1.164 4 3.29 6 6.61 0 0.00	C4	
PER PEN PEN PEN RS NRS FV RESU Electi Param HW NHW RW CRI	RRE RRM RT RT RT RF RM RT VV VV D D U R	Renew Rene resourc Total us Non rene n Total prima Use of re Use of n Use of n Hazar Non haz Radioa Con	Parar rable prir energy wable prir es as ma se of ren energy re ewable p energy ewable p material r use of n ary ener of secon enewable on rener e of net le LCA cal Exi Paran rdous wa rardous active wa mponents terials for	mary energy ener	ergy as mergy illization orimary s mergy as merg	[MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	1.22 0.00 1.22 8.95 0.00 8.95 6.68 0.00 0.00 3.75 VS ANI 3.23E-0 6.45E+0 0.00E+0 0.00E+0	E+02 E+00 E+02 E+00 E+02 E+00 E+00 E+00	3.39E+1 0.00E+1	A5	02 1.18 01 6.26 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 01 3.67E 0.00E 0.00E	BE+02	B6	C2 0 1.11E 1 2.83E+ 0 0.00E+ 0 0.00E+ 0 0.00E+ 0 0.00E+ 0 0.00E+ 0 0.00E+ 0 0.00E+0	00 1.60 00 0.00 00 0.00 00 0.00 00 0.00 05 8.63 Series 6 1.16 4 3.29 6 6.61 0 0.00 0 0.00	C4	
PER PEN PEN PEN RS NRS FV RESU Electi Param HW RW CRI MEI	RRE RRM RRT RRE RRM IRT IRT VV VV D D U R R R	Renew Rene resourc Total us Rene Rene resourc Total us Rene Rene Rene Rene Rene Rene Rene Ren	Parar rable prir energy wable prir es as ma se of ren energy re ewable p energy energ	mary energy ener	ergy as mergy as merg	Unit [kg] [kg]	1.22 0.00 1.22 8.95 0.00 8.95 6.68 0.00 0.00 3.75 VS ANI 3.23E-0 6.45E+0 0.00E+0 0.00E+0 0.00E+0	E+02 E+00 E+02 E+00 E+02 E+00 E+00 E+00	3.39E+1 0.00E+1 0.00E+1 0.00E+1 0.00E+1 0.00E+1 0.00E+1 0.00E+1 0.00E+10 0.00E+00 0.00E+00 0.00E+00	A5	02 1.18 01 6.26 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 1.36 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00	BE+02	B6	C2 0 1.11E 1 2.83E+ 0 0.00E+ 0 0.00E+ 0 0.00E+ 0 3.56E- 0 3.70E- 0 0.00E+ 0 0.00E+ 0 0.00E+ 0 0.00E+ 0 0.00E+	00 1.60 00 0.00 00 0.00	C4	
PER PEN PEN PEN SM RS NRS FV RESU Electi Param HW NHW RW CRI	RRE RRM RRT RRE RRM IRT IRT VV U RR RR RRE RRM RR RRE RRM	Renew Rene resource Total us Rene Rene resource Rene Rene Rene Rene Rene Rene Rene Re	Parar rable prir energy wable prir es as ma se of ren energy re ewable p energy energ	mary energy ener	ergy as mergy as merg	Unit [kg] [kg]	1.22 0.00 1.22 8.95 0.00 8.95 6.68 0.00 0.00 3.75 VS ANI 3.23E-0 6.45E+0 0.00E+0 0.00E+0	E+02 E+00 E+02 E+00 E+02 E+00 E+00 E+00	1.33E-0 1.33E-0 1.33E-0 3.39E+1 0.00E+1 0.00E+1 0.00E+1 0.00E+0 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00	A5	02 1.18 01 6.26 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 1.437E 0.00E 0.00E 0.00E	BE+02	B6	C2 0 1.11E 1 2.83E+ 0 0.00E+ 0 0.00E+ 0 0.00E+ 0 3.56E- 0 3.70E- 0 0.00E+	01 1.09 00 1.60 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00		



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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. Tel +49 (0)30 - 3087748- 0 +49 (0)30 – 3087748 - 29 info@bau-umwelt.com Panoramastr 1 Fax 10178 Berlin Mail Germany Web www.bau-umwelt.com



Author of the Life Cycle Assessment

PE INTERNATIONAL AG Tel +49 (0)711 341817-0 Hauptstraße 111-113 Fax +49 (0)711 341817-25 70771 Leinfelden-Echterdingen Mail info@pe-international.com www.pe-international.com Web Germany



Owner of the Declaration

SARGENT Manufacturing Company Tel 100 Sargent Drive, Fax New Haven, CT 06511 USA

Mail webmaster@sargentlock.com Web www.sargentlock.com

www.assaabloydss.com

800-727-5477

888-863-5054