ENVIRONMENTAL PRODUCT DECLARATION

HANCHETT ENTRY SYSTEMS, INC.

9600 SERIES ELECTRIC STRIKE

The HES 9600 series is a windstorm rated, surface mounted electric strike designed to accommodate rim exit devices with a 3/4" throw latchbolt. All components are completely encased within its 3/4" thick stainless steel housing, no cutting on the frame is required for installation.

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 HES 9600 Series Electric Strike 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.

Institut Bauen und Umwelt e.V.

CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

ENVIRONMENTAL PRODUCT DECLARATION

hes

ASSA ABLOY

Hanchett Entry Systems, Inc.
9600 Series Electric Strike

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	ASSA ABLOY / Hanchett Entry Systems, Inc.
ULE DECLARATION NUMBER	4786545067.128.1
IBU DECLRATION NUMBER	EPD-ASA-20150139-IBA1-EN
DECLARED PRODUCT	9600 Series Electric Strike
REFERENCE PCR	IBU: PCR Locks and fittings (mechanical & electromechanical locks & fittings), 07-2014

DATE OF ISSUE	May 18, 2015
PERIOD OF VALIDITY	5 years

CONTENTS OF THE DECLARATION	General information Product / Product description LCA calculation rules LCA scenarios and further technical information LCA results References
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 as the core PCR. This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories ☐ INTERNAL ☒ EXTERNAL	Wade Stout
This life cycle assessment was independently verified in accordance with EN 15804 and the reference PCR by:	IBU – Institut Bauen und Umwelt e.V.

Environment

1. General Information

Hanchett Entry Systems, Inc.	9600 series
Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the Declaration** Hanchett Entry Systems, Inc. 10027 S. 51st St, Ste. 102 Phoenix, AZ 85044
Declaration number EPD-ASA-20150139-IBA1-EN	**Declared product / Declared unit** The declaration represents 1 electric strike – 9600 series consisting of the following items: - Strike body and cover - Mounting screws, lockdown screws & cover screws - 12-Volt and 24-Volt pigtails
This Declaration is based on the Product Category Rules: Locks and fittings , 07.2014 (PCR tested and approved by the independent expert committee)	**Scope:** This declaration and its LCA study are relevant to 9600 series electric strike. The primary manufacturing processes are made by external suppliers and the final manufacturing processes and assembly occur at our manufacturing factory in Arizona, United States. 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. 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 18.05.2015	
Valid to 17.05.2020	**Verification** The CEN Standard EN 15804 serves as the core PCR Independent verification of the declaration 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

Product name: HES 9600 Series

Product characteristic: electric strike
The HES 9600 series is a windstorm rated, surface mounted electric strike designed to accommodate rim exit devices with a 3/4" throw latchbolt. All components are completely encased within its 3/4" thick stainless steel housing, so no cutting on the frame is required for installation. It is field selectable for fail secure and fail safe operation, and for 12 or 24VDC.

2.2 Application

9600 Series electric strikes are ideal for a wide range of applications – from private to commercial and public sectors both light and heavy duty usage:
- Door openings that are secured with a rim exit device where someone wants to add access control or traffic control
- Emergency exit doors
- Frequently used doors.

2.3 Technical Data

The table presents the technical properties of HES 9600 Series:

Technical data

Parameter	Value	Unit
Static strength	2.000	lbs.
Dynamic strength	70	ft-lbs.
Endurance	1,000,000	cycles
Dual voltage	12 or 24	VDC

2.4 Placing on the market / Application rules

The standards that can be applied for 9600 Series electric strikes are:
• ANSI 250.13-2003 Severe Windstorm listed
• Florida Building Code Approved (FL#14307)

- UL 1034 burglary-resistant listed and suitable for outdoor use
- UL 294 (6th Edition) listed
- ANSI/BHMA, A156.31 Grade 1 (#E09731, #E09732, #E09373)
- RoHS compliant
- Patent # 6,390,520 & 8,454,063

2.5 Delivery status
Electric strikes are delivered as in a box size - 9.75 x 3 x 2.5 Inches.

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 9600 Series is as following:

Component	Percentage in mass (%)
Steel	0.4
Stainless Steel	92.0
Electro mechanics	6.6
Other	1.0
Total	100.0

2.7 Manufacture
The primary manufacturing processes are made by Tier 1 suppliers and the final manufacturing processes occur at factory in China. The electronics are produced in China & Taiwan and the mechanics in China & USA. The components come from processes like stamped steel, turning, zinc and steel casting. Final assembly takes place in Phoenix, Arizona, USA.
The factory in Phoenix, AZ USA has a certification of Quality Management system in accordance with ISO 9001:2008.

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 roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance.
- 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
9600 Series electric strikes are distributed through and installed by trained installation technicians, such as locksmiths, carpenters etc. adhering to local/national standards and requirements.

2.10 Packaging
HES 9600 Series electric strikes are packed in a cardboard box with corrugated carton inlays. The packaging is fully recyclable. Separate lock case package with dimensions: 9.75 x 3 x 2.5 Inches. Material composition of packaging in % of total packaging mass is as following:

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

2.11 Condition of use
To maintain low friction and secure latching, annual maintenance <1g of grease on contact surfaces of latchbolt is recommended.
No cleaning. Electric strikes can be replaced or upgraded without changing control unit or installation cable.

2.12 Environment and health during use
There is no harmful emissive potential. No damage to health or impairment is expected under normal use corresponding to the intended use of the product.

2.13 Reference service life
Approved for 1,000,000 cycles under normal working conditions, 15 years depending on cycle frequency.

2.14 Extraordinary effects

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

Water
Contain no substances that have any impact on water in case of flood. Electric operation of the device will be influenced 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 electric strikes 9600 can be mechanically dissembled to separate the different materials. 99% of the materials used are recyclable. 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. 99.1% of the materials used are recyclable. The rest is disposed as a construction waste for landfill.

2.17 Further information
Hanchett Entry Systems, Inc.
10027 S. 51st St, Ste. 102
Phoenix, AZ 85044

Tel: 1-800-626-7590
http://www.hesinnovations.com
www.hesinnovations.com

3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of electric strike 9000 Series 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	1	piece of electric strike
Mass (without packaging)	0.698	kg
Conversion factor to 1 kg	1.432	-

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

Use stage related to the operation of the building includes:

- B6 – Operational energy use

End-of-life stage:

- C2 – Transport to waste processing
- C3 – Waste processing for recycling
- 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 electric strike 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 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)	0.06	kg

Reference service life

Name	Value	Unit
Reference service life	15	a

Operational energy use (B6)

Name	Value	Unit
Electricity consumption	394	kWh
Days per year in use	365	d
Hours per day in on mode	12	h
Power consumption on mode in W	6	W

End of life (C1-C4)

Name	Value	Unit
Collected separately Steel, stainless steel, electro mechanics	0.691	kg
Collected as mixed construction waste – construction waste for landfilling	0.007	kg
Reuse Plastics	0.001	kg
Recycling Steel, stainless steel, electro mechanics	0.690	kg
Landfilling - Construction waste for landfilling	0.007	kg

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

Name	Value	Unit
Collected separately waste type (including packaging)	0.756	kg
Recycling Steel	0.41	%
Recycling Stainless steel	84.94	%
Recycling Electro mechanics	5.93	%
Reuse Plastics	0.20	%
Reuse Paper packaging (from A5)	7.62	%
Loss Construction waste for landfilling (no recycling potential)	0.90	%

5. LCA: Results

Results shown below were calculated using CML 2001 – 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 HES 9600 Series

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	6.07E+00	4.31E-02	8.16E-02	2.65E+02	8.99E-04	7.68E-03	3.58E-02	-1.31E+00
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	1.98E-09	2.07E-13	3.73E-13	9.16E-08	4.30E-15	5.25E-12	1.03E-13	-5.68E-11
AP	Acidification potential of land and water	[kg SO_2-Eq.]	4.65E-02	1.97E-04	1.86E-05	8.95E-01	4.11E-06	3.62E-05	1.34E-05	-1.13E-02
EP	Eutrophication potential	[kg $(PO_4)^{3-}$- Eq.]	3.27E-03	4.51E-05	3.25E-06	4.78E-02	9.39E-07	2.04E-06	2.50E-06	-5.27E-04
POCP	Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	2.89E-03	-6.37E-05	1.32E-06	5.47E-02	-1.33E-06	2.15E-06	8.94E-07	-6.39E-04
ADPE	Abiotic depletion potential for non fossil resources	[kg Sb Eq.]	1.47E-03	1.63E-09	1.47E-09	3.50E-05	3.39E-11	1.06E-09	7.01E-09	-4.38E-04
ADPF	Abiotic depletion potential for fossil resources	[MJ]	7.01E+01	5.95E-01	2.29E-02	3.05E+03	1.24E-02	8.72E-02	2.22E-02	-1.45E+01

Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources

RESULTS OF THE LCA - RESOURCE USE: One piece of HES 9600 Series

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	8.23E+00	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	8.23E+00	2.35E-02	2.13E-03	2.99E+02	4.89E-04	2.50E-02	2.56E-03	-1.39E+00
PENRE	Non renewable primary energy as energy carrier	[MJ]	7.54E+01	-	-	-	-	-	-	-
PENRM	Non renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PENRT	Total use of non renewable primary energy resources	[MJ]	7.54E+01	5.97E-01	2.68E-02	3.87E+03	1.24E-02	1.37E-01	2.60E-02	-1.52E+01
SM	Use of secondary material	[kg]	5.29E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	Use of renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	Use of non renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	Use of net fresh water	[m³]	3.76E-02	1.65E-05	2.37E-04	1.36E+00	3.45E-07	6.16E-05	1.40E-04	-8.45E-03

Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of HES 9600 Series

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	3.00E-03	1.36E-06	1.84E-06	3.01E-03	2.83E-08	1.89E-05	3.71E-06	-2.15E-04
NHWD	Non hazardous waste disposed	[kg]	1.55E+00	7.51E-05	2.05E-03	1.23E+00	1.56E-06	4.41E-05	5.66E-03	-5.69E-01
RWD	Radioactive waste disposed	[kg]	2.09E-03	7.82E-07	1.57E-06	3.18E-01	1.63E-08	1.97E-05	1.51E-06	-2.74E-04
CRU	Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
MFR	Materials for recycling	[kg]	0.00E+00	0.00E+00	5.76E-02	0.00E+00	0.00E+00	6.46E-01	0.00E+00	-
MER	Materials for energy recovery	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
EEE	Exported electrical energy	[MJ]	0.00E+00	0.00E+00	1.03E-01	0.00E+00	0.00E+00	0.00E+00	3.25E-02	-
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	2.91E-01	0.00E+00	0.00E+00	0.00E+00	8.92E-02	-

Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

6. LCA: Interpretation

This chapter contains an interpretation of the Life Cycle Impact Assessment categories. 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 2% and 6% to the overall results for all the environmental impact assessment categories hereby considered, except for the abiotic depletion potential (ADPE). For this, the contribution from the production phase accounts for app. 98% - this impact category describes the reduction of the global amount of non-renewable raw materials; therefore, as expected, it is mainly related with the extraction of raw materials (A1).

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. Stainless steel accounts with app. 92% 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 major contribution for all the impact assessment categories considered - between 93% and 97%, with the exception of ADPE (2%). This is a result of 12 hours of operation in on mode per day and per 365 days in a year.

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 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 250.13-2003 Severe Windstorm listed
Testing and Rating of Severe Windstorm Resistant Components for Swinging Door Assemblies

ANSI/BHMA A156.31
ANSI/BHMA A156.31 establishes requirements for Electric Strikes and Frame Mounted Actuators, and includes operational and finish tests.

Florida Building Code Approved (FL#14307)

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 1034
Burglary-Resistant Electric Locking Mechanisms

UL 294
Access Control System Units

RoHS compliant
The RoHS directive aims to restrict certain dangerous substances commonly used in electronic and electronic equipment.

Patent # 6,390,520
This invention relates to an electric door opener with a keeper subject to the action of an armature and a magnet coil which is selectively positioned for releasing or locking a door latch.

Patent # 8,454,063
The present invention relates to mechanisms for electrically locking a door in a frame; more particularly, to such mechanisms wherein the electrical mechanism is switchable between fail-safe and fail-secure modes of operation; and most particularly, to a mode-switchable electric door strike wherein the mode is easily selectable by positioning of a stop at one of two alternate positions without requiring movement or repositioning of any other components of the strike

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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 HES 9600 Series

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	6.07E+00	4.31E-02	8.16E-02	2.65E+02	8.99E-04	7.68E-03	3.58E-02	-1.31E+00
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	2.02E-09	2.20E-13	3.97E-13	9.75E-08	4.58E-15	5.59E-12	1.10E-13	-6.04E-11
AP	Acidification potential of land and water	[kg SO_2-Eq.]	4.56E-02	2.58E-04	2.25E-05	8.36E-01	5.37E-06	3.43E-05	1.66E-05	-1.06E-02
EP	Eutrophication potential	[kg N-eq.]	1.87E-03	1.82E-05	1.30E-06	4.11E-02	3.80E-07	1.46E-06	1.11E-06	-2.79E-04
Smog	Ground-level smog formation potential	[kg O_3-eq.]	5.76E-01	5.31E-03	5.26E-04	7.12E+00	1.11E-04	3.10E-04	4.11E-04	-9.30E-02
Resources		[MJ]	4.28E+00	8.56E-02	2.68E-03	1.80E+02	1.78E-03	6.21E-03	2.19E-03	-9.15E-01

RESULTS OF THE LCA - RESOURCE USE: One piece of HES 9600 Series

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	8.23E+00	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	8.23E+00	2.35E-02	2.13E-03	2.99E+02	4.89E-04	2.50E-02	2.56E-03	-1.39E+00
PENRE	Non renewable primary energy as energy carrier	[MJ]	7.54E+01	-	-	-	-	-	-	-
PENRM	Non renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PENRT	Total use of non renewable primary energy resources	[MJ]	7.54E+01	5.97E-01	2.68E-02	3.87E+03	1.24E-02	1.37E-01	2.60E-02	-1.52E+01
SM	Use of secondary material	[kg]	5.29E-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]	3.76E-02	1.65E-05	2.37E-04	1.36E+00	3.45E-07	6.16E-05	1.40E-04	-8.45E-03

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of HES 9600 Series

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	3.00E-03	1.36E-06	1.84E-06	3.01E-03	2.83E-08	1.89E-05	3.71E-06	-2.15E-04
NHWD	Non hazardous waste disposed	[kg]	1.55E+00	7.51E-05	2.05E-03	1.23E+00	1.56E-06	4.41E-05	5.66E-03	-5.69E-01
RWD	Radioactive waste disposed	[kg]	2.09E-03	7.82E-07	1.57E-06	3.18E-01	1.63E-08	1.97E-05	1.51E-06	-2.74E-04
CRU	Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
MFR	Materials for recycling	[kg]	0.00E+00	0.00E+00	5.76E-02	0.00E+00	0.00E+00	6.46E-01	0.00E+00	-
MER	Materials for energy recovery	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
EEE	Exported electrical energy	[MJ]	0.00E+00	0.00E+00	1.03E-01	0.00E+00	0.00E+00	0.00E+00	3.25E-02	-
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	2.91E-01	0.00E+00	0.00E+00	0.00E+00	8.92E-02	-

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