# **ENVIRONMENTAL PRODUCT DECLARATION**

as per ISO 14025 and EN 15804

Owner of the Declaration ASSA ABLOY (HID Global)

Programme holder Institut Bauen und Umwelt e.V. (IBU)

Publisher Institut Bauen und Umwelt e.V. (IBU)

Declaration number EPD-ASA-20150218-IBA1-EN

Issue date 17.08.2015

# Access control systems – iCLASS SE RP40 ASSA ABLOY / HID Global



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





# 1. General Information

#### **HID Global**

#### Programme holder

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

#### **Declaration number**

EPD-ASA-20150218-IBA1-EN

# This Declaration is based on the Product Category Rules:

Electronic Access Control Systems, 11-2013 (PCR tested and approved by the independent expert committee (SVR))

#### Issue date

17.08.2015

#### Valid to

16.08.2020

Wermanes
Prof. Dr.-Ing. Horst J. Bossenmayer

(President of Institut Bauen und Úmwelt e.V.)

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

# **iCLASS SE RP40**

# Owner of the Declaration

ASSA ABLOY (HID Global) 611 Center Ridge Drive Austin, TX 78753 USA

# **Declared product / Declared unit**

This Declaration represents 1 card reader model iCLASS SE RP40, with pigtail, including all custom configurations.

# Scope:

The Life Cycle Assessment is based on data collected by the contract manufacturer of the RP40 at their production facility located in Philippines.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

#### Verification

The CEN Standard EN 15804 serves as the core PCR

Independent verification of the declaration and data according to ISO 14025

internally

externally



Dr. Wolfram Trinius

(Independent verifier appointed by SVR)

# 2. Product

# 2.1 Product description

The iCLASS SE RP40 reader, produced by HID Global, an ASSA ABLOY Group brand, is a device that communicates with a personalized credential via RF technology.

The 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. The reader is capable of communications using a high or low frequency RF signal and able to communicate with several credential formats. Also factory settings can be updated to various configurations allowing the reader flexibility in its function.

Supported credential formats:

- iCLASS SE (Cards/Tags/Fobs)
- SE for DESFire EV1 (Cards)
- SE for MIFARE Classic (Cards/Tags/Fobs)
- HID Prox / AWID (Cards/Tags/Fobs)
- Indala Prox (Cards/Tags/Fobs)

# Configurable functions:

- LED function
- · Audible signal (Beep)
- Communication format

Optical Tamper

# 2.2 Application

The iCLASS SE RP40 reader 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 iCLASS SE RP40 reader:

# **Technical data**

recillical data		
Parameter	Value	Unit
Mounting	Wall Switch Size	-
Power supply	5-16VDC	V
Current Requirements	100mA	Α
Operating Temperature	-35 to 65	°C
Operating Humidity	5% to 95%	%
Transmit Frequency	13.56MHz and 125kHz	kHz
Power Input "Standby"	1.36	W
Power Input "Operation"	1.6	W



# 2.4 Placing on the market / Application rules

# Compliance with US, Canada, and CB Scheme Safety:

- UL294-The Standard of Safety for Access Control System Units
- C22.2 No. 205 Signal Equipment
- CB Certificate US-21166-UL

# Compliance with US and Canada Unlicensed Radios:

- US FCC Radio Certification 47 CFR Part 15, Subpart C
- Canada Radio Certification RSS-210 Issue 8: 2010

# Compliance with the European Union R&TTE Directive:

The products are subject to CE marking according to the relevant harmonization legislation. Affixing the CE marking to the products means the compliance of the product with the a. m. Directive.

The following standards apply:

- EN 60950-1: 2006/ All: 2009 +A1:2010 +A12:2011 Information technology equipment Safety Part1: General requirements
- EN 301 489-1 V1.9.2 Common Technical Requirements
- EN 301 489-3 V1.6.1 Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz
- EN 50130-4:2011 Alarm systems Electromagnetic Compatibility and Environmental test methods
- ETSI EN 300 330-2 V1.5.1 Electromagnetic Compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

# Compliance with the RoHS2 Directive

The products are subject to CE marking according to the relevant harmonization legislation. Affixing the CE marking to the products means the compliance of the product with the a. m. Directive.

The following standard applies:

EN 50581:2012 – RoHS2 Conformity

# 2.5 Delivery status

Each reader unit is delivered individually packaged with mounting plate, and mounting hardware. Packaged reader dimensions: 3.3" x 4.8" x 1.0" (8.4cm x 12.2cm x 2.4cm).

#### 2.6 Base materials / Ancillary materials

The average composition of iCLASS SE RP40 reader is as following:

Component	Percentage in mass (%)
Plastics	62.2
Stainless Steel	3.2
Glass	9.3
Electronics (signal-power)	16.9
Electronics (signal)	0.9

Component	Percentage in mass (%)
Electro-mechanics (cables)	7.5
Total	100.0

#### 2.7 Manufacture

The iCLASS SE RP40 is assembled at a contract manufacturer's production facility in the Philippines. The injection molded parts are purchased from an external supplier. The electronic components, including PCB, are purchased externally and assembled at the contract manufacturer's production facility. During assembly the individual parts are assembled into the reader bezel and then potted into place. The assembled reader is then packaged with the mounting plate and hardware for shipment.

# 2.8 Environment and health during manufacturing

The Management System of the contract manufacturer has been assessed and certified as meeting the requirements of ISO 14001:2004 standard. In addition, industrial safety is certified as compliant to OHSAS 18001 standard.

# 2.9 Product processing/Installation

iCLASS SE RP40 readers are installed by trained product integrators or by the product end user. Installation instructions are included with each reader unit.

# 2.10 Packaging

The reader is packed in a cardboard box. Also included in the packaging are paper installation instructions, and a plastic bag containing the connectors and mounting hardware. Packaging materials shall be collected separately for recycling.

Material	Value (%)
Cardboard/ Paper	98.02
Plastics	1.98
Total	100.0

# 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

The service life of the iCLASS SE RP40 reader is estimated to be 30 years. This number is based on the most conservative Mean Time Between Failure (MTBF) data available for the reader components at elevated operation temperatures. MTBF of 270110 hours at 65°C.

#### 2.14 Extraordinary effects

#### Fire

The external housing of the RP40, consisting of the bezel and mounting plate, are constructed from polycarbonate resin thermoplastic. The housing material, and thus the reader as a whole unit, has been classified as having a UL94 HB Flame Rating. A UL94 Flame Rating of HB indicates: slow burning on a



horizontal specimen; burning rate < 76 mm/min for thickness < 3 mm and burning stops before 100 mm.

#### Water

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

#### Mechanical destruction

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

#### 2.15 Re-use stage

The following possibilities arise with reference to the material composition of the reader.

#### Re-use

During the reference service life, the reader can be disconnected and dismounted then remounted and attached elsewhere.

Material Recycling

The card reader can be recycled according to local electronics recycling options offered by municipalities, electronics recyclers or garbage haulers.

#### 2.16 Disposal

Packaging components incurred during installation are directed to local paper and cardboard recyclers.

The product can be mechanically dissembled to separate different materials. For this, collection rate of 5% was assumed. The rest is disposed as a construction waste for landfill.

# 2.17 Further information

More information on ASSA ABLOY (HID Global) and iCLASS SE readers is available by:

ASSA ABLOY (HID Global) 611 Center Ridge Drive Austin, TX 78753 USA

Tel: 512-776-9000

Internet: www.hidglobal.com

# 3. LCA: Calculation rules

#### 3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of iCLASS SE RP40 reader 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 iCLASS SE RP40
Mass (without packaging)	0.27	kg
Conversion factor to 1 kg	3.72	-

#### 3.2 System boundary

Type of the EPD: cradle to gate - with options The following life cycle stages were considered: Production stage:

- A1 Raw material extraction and processing
- A2 Transport to the manufacturer and
- A3 Manufacturing.

# Construction stage:

- A4 Transport from the gate to the site
- A5 Packaging waste processing

Use stage related to the operation of the building includes:

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

# End-of-life stage:

- C2 Transport to waste processing,
- C3 Waste processing for recycling and
- C4 Disposal (landfill).

These information modules include provision and transport of all materials, products, as well as energy and water provisions, waste processing up to the end-of-waste state or disposal of final residues.

#### Module D:

 Declaration of all benefits or recycling potential from EoL and A5

#### 3.3 Estimates and assumptions

#### Use stage:

For the use stage, it is assumed that the iCLASS SE RP40 reader 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 stage of the product, a recycling scenario with a 5% collection rate was assumed. For packaging material, a 100% collection rate was assumed.

# 3.4 Cut-off criteria

In the assessment, all available data from the production process are considered, i.e. all raw materials used, auxiliary materials (e.g. lubricants), thermal energy consumption and electric power consumption - including material and energy flows contributing less than 1% of mass or energy (if available). In case a specific flow contributing less than 1% in mass or energy is not available, worst case assumption proxies are selected to represent the respective environmental impacts.

Impacts relating to the production of machines and facilities required during production are out of the scope of this assessment.

# 3.5 Background data

For life cycle modeling of the considered products, the GaBi 6 Software System for Life Cycle Engineering, developed by thinkstep AG, is used /GaBi 6 2013/. The GaBi-database contains consistent and documented datasets which are documented in the online GaBi-documentation /GaBi 6 2013D/. To ensure comparability of results in the LCA, the



basic data of GaBi database were used for energy, transportation and auxiliary materials.

# 3.6 Data quality

The requirements for data quality and background data correspond to the specifications of the /IBU PCR PART A/.

thinkstep AG performed a variety of tests and validations during the commission of the present study in order to ensure its quality of the present document and results. 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. Following specific life cycle inventories for the WIP are considered:

- Waste incineration of plastic
- · Waste incineration of paper
- Waste incineration of electronic scrap

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

Installation into the building (A5)

mistaliation into the building (F	<del>1</del> 3)	
Name	Value	Unit
Output substances following waste treatment on site (Paper packaging)	0.0644	kg
Output substances following waste treatment on site (Plastic packaging)	0.0013	kg

# Reference service life

Name	Value	Unit
Reference service life	30	а

Operational energy use (B6)

<u> </u>		
Name	Value	Unit
Electricity consumption	342.52	kWh
Years in use	30	Years
Days per year in use	365	Days
Hours per day in on mode	1	h
Hours per day in stab-by mode	23	h
Power consumption on mode	1.6	W
Power consumption stand-by mode	1.36	W

End of life (C2-C4)

Name	Value	Unit
Collected separately plastics, stainless steel, electronics	0.0122	kg
Collected as mixed construction waste construction waste for landfilling	0.2566	kg
Reuse plastic parts	0.0084	kg
Recycling stainless steel, electronics	0.0038	kg
Landfilling - Construction waste for landfill	0.2566	kg

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

Name	Value	Unit

Collected separately waste Card reader (including packaging)	0.3344	kg
Recycling stainless steel	0.13	%
Recycling electronics	1.01	%
Thermal treatment (plastics)	2.50	%
Loss Construction waste for landfilling (no recycling potential)	76.71	%
Reuse packaging (paper)	19.26	%
Reuse packaging (plastics)	0.39	%



# 5. LCA: Results

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

DESC	`RIP	TION O	E THE	SYST	EM BO	מאווכ	ARY (	<b>Y</b> — I	INCLU	DED IN	I CA:	MNI	) – MOD	LILE NO	וח דר	-CL /	ARED)
DEGC	<i>/</i> 1\11	HON C			EM BOUNDARY (X = INCLUDED IN LCA;								) = MOD	OLL IN	ים וכ	_	EFITS AND
PROD	DUCT	STAGE		RUCTI OCESS AGE			US	SE ST	TAGE				END OF L	IFE STAC	βE	BEY S	OADS OND THE YSTEM JNDARYS
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement <sup>1)</sup>	Refurbishment <sup>1)</sup>	Operational energy use	Operational water	De-construction	demolition  Transport  Waste processing		Transport  Waste processing  Disposal		Recovery- Recycling- potential
<b>A</b> 1	A2	A3	A4	A5	B1	B2	В3	B4	4 B5	В6	B7	C.	1 C2	C3	C4		D
Х	Χ	Х	Χ	Х	MND	MND	MND	MN	D MNE	) X	MNE	MN	ID X	Х	Χ		Χ
RESU	JLTS	OF TH	IE LC	۱ - EN	/IRON	MENT	AL IM	PAC	CT: On	e piece	of iC	LASS	SE RP	40 read	er		
Param	eter	Pa	aramete	r	Uı	nit	A1 - A	.3	A4	A5	1	B6	C2	СЗ	(	24	D
GWI	Р	Global wa	arming p	otential	[kg CC	D <sub>2</sub> -Eq.]	4.95E+	-00 9	9.48E-02	9.12E-02	2 2.42	E+02	7.94E-04	2.68E-03	3 4.41	E-01	-1.15E+00
ODF	P	Depletion stratosph			[kg CFC	11-Eq.	1.15E-	09 :	3.80E-13	4.17E-10	3 8.37	7E-08	3.80E-15	1.83E-12	2 1.30	E-12	-1.10E-10
AP	, ,	Acidificatio	n potenti		[kg SC	D <sub>2</sub> -Eq.]	2.96E-	02	1.95E-03	2.08E-0	5 8.17	7E-01	3.63E-06	1.26E-05	5 1.15	E-04	-1.12E-02
EP	,		nd water cation po	otential	[kg (PO		2.48E-	03 2	2.18E-04	3.63E-06	6 4.37	7E-02	8.30E-07	7.11E-07	7 9.14	E-06	-6.18E-04
POC	P	tropos	tion poten spheric oz emical ox	one	[kg Eth	en Eq.]	2.10E-	03	5.31E-05	1.48E-06	5.00	0E-02	-1.17E-06	7.50E-07	5.73	E-06	-5.94E-04
ADP	E '	Abiotic dep		tential for	[kg Sl	b Eq.]	4.74E-	04	2.86E-09	1.65E-09	3.19	9E-05	2.99E-11	3.70E-10	3.15	E-08	-6.94E-04
ADP	F '	Abiotic dep	letion po	tential for	[N	1J]	6.72E+	-01 1	1.22E+00	2.56E-02	2 2.79	E+03	1.10E-02	3.04E-02	2 1.92	E-01	-1.30E+01
	fossil resources		<b>C</b> O	1					RP40 reader								
RESU	JLTS	OF TH	IE LCA	A - RES	SOURC	E US	E: On	e pi	ece of	iCLASS	SE F	RP40	reader				
RESU Param		OF TH	IE LC <i>A</i> Parar		SOURC	Un		e pio I - A3		iCLASS A5		RP40 B6	reader C2	СЗ		C4	D
	eter		Parar	neter nary ene			it A		A4					C3		C4 -	D -
Param	eter RE	Renew	Parar rable prir energy wable pr	meter mary ene carrier rimary er	ergy as	Un	it A	I - A3	<b>A4</b>				C2	C3 -		C4 -	D -
<b>Param</b> PER	eter RE	Renew Rene resource Total us	Parar rable prir energy wable pringes as ma se of ren	meter mary ene carrier rimary er aterial uti ewable p	ergy as nergy lization orimary	Un [Mc	it A.  J] 5.70  J] 0.00	<b>I - A3</b> DE+0	A4 00 -	A5	i		C2 -	C3 4 8.70E-0		<b>C4</b> 5E-02	<b>D</b> 7.80E-01
Param PER PER	RE RE RM	Renew Rene resource Total us	Parar vable prir energy wable pringes as ma se of ren energy re	meter mary ene carrier rimary er aterial uti ewable p esources rimary ei	ergy as nergy lization orimary	Un [M.	it A' 5.70  J] 0.00  J] 5.70	0E+0 0E+0	A4 00 - 00 - 00 2.08E-	A5	i	B6 -	C2 -	-		-	-
Param PER PER	RE RE	Renew Rene resource Total us Non rene	Parar vable pring ewable pringes as ma se of rengenergy re ewable penergy ewable penergy	mary ene carrier rimary er aterial uti ewable pesources rimary er carrier rimary er	ergy as hergy lization primary hergy as	Un [MJ [MJ	it A <sup>2</sup> J] 5.70  J] 0.00  J] 5.70  J] 7.50	0E+0 0E+0	A4 00 - 00 - 00 2.08E-	A5	i	B6 -	C2 -	-		-	-
Param PER PER PER	RE RE RM	Renew Rene resource Total us Non rene Non rene	Parar rable prir energy wable pries as ma se of ren energy re ewable p energy ewable p naterial u of non re	mary ene carrier rimary er aterial uti ewable p esources rimary er carrier rimary er utilization enewable	ergy as ergy lization orimary ergy as ergy as ergy as	Un [M. [M. [M. [M. [M.	A           J]         5.70           J]         0.00           J]         5.70           J]         7.50           J]         0.00	0E+0 0E+0 0E+0 0E+0 0E+0	A4 00 - 00 - 00 2.08E- 01 - 00 -	-02 2.38E	-03 2.	B6 - - 73E+0 -	C2 -	- 4 8.70E-0	03 1.4	- - 5E-02 -	- -7.80E-01
PER PER PENF	RE RE RM RT	Renew Rene resource Total use Non rene Non rene Total use	Parar rable prir energy wable pries as ma se of ren energy re ewable p energy ewable p naterial u of non re	meter mary ene carrier rimary er aterial uti ewable p esources rimary er carrier rimary er utilization	ergy as hergy lization orimary hergy as	Un [Mc	it A  J] 5.7(  J] 0.00  J] 7.50  J] 7.50  J] 7.50	0E+0 0E+0 0E+0 0E+0 0E+0 0E+0	A4	-02 2.38E -02 3.00E	-03 2.	B6 - - 73E+0 - - 53E+0	C2 2 4.32E-0 3 1.10E-0	- 4 8.70E-0 - - 2 4.76E-0	)3 1.4	- 5E-02 - - 4E-01	- -7.80E-01
Param PER PER PENF	RE RE RT RT	Renew Rene resource Total use Non rene Non rene Total use	Parar rable prir energy wable pries as masses of ren energy re ewable p energy ewable p energy ewable p naterial u of non re energy re of secon	mary ene carrier rimary er atterial uti ewable p esources rimary er carrier rimary er utilization enewable esources dary mat	ergy as ergy lization primary ergy as e primary	Un [Mc	it A:  J] 5.7:  J] 0.00  J] 7.5:  J] 0.00  J] 7.5:  J] 2.8	0E+0 0E+0 0E+0 0E+0 0E+0 0E+0 0E+0	A4 A	-02 2.38E -02 3.00E	-02 3. +00 0.	B6 - 73E+0 - 53E+0 00E+0	C2 2 4.32E-0 - 3 1.10E-0 0 0.00E+0		03 1.4	- 5E-02 - - 4E-01	- -7.80E-01 - - -1.41E+01
Param PER PER PENF PENF SM	RE RE RT M	Renew Rene resource Total us Ron rene Non rene n Total use Use	Parar vable prir energy wable priv eses as ma se of ren energy re ewable p energy ewable p naterial u of non re energy re of secon	mary ene carrier rimary er example per sources rimary er example per sources rimary er example per exa	nergy as lization primary as nergy fuels	Un [M.	it         A           J]         5.7/           J]         0.00           J]         5.7/           J]         7.5/           J]         0.00           J]         7.5/           J]         0.00           J]         0.00	1-A3 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0	A4 00 - 00 - 00 2.08E- 01 - 00 - 01 1.22E+ 0 0.00E+	-02 2.38E -02 3.00E -00 0.00E	-03 2. -02 3. +00 0.	B6 73E+0 53E+0 00E+0	C2		03 1.4: 02 2.1: 00 0.00 00 0.00	- - 5E-02 - - - 4E-01 0E+00	-7.80E-01 
Param PER PER PENI PENI PENI RSI	RE RE RT M	Renew Rene resource Total us Non rene n Total use Use of re	Parar vable prir energy wable pi es as ma se of ren energy re energy re energy energy energy energy energy re of non re energy re of secon enewable on renev	mary ene carrier rimary er example per sources rimary er example per sources rimary er example per exa	ergy as ergy lization orimary ergy as e primary erial ary fuels condary	Un [M.	it A  J 5.70  J 0.00  J 5.70  J 7.50  J 0.00  J 7.50  J 0.00	11-A3 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0	A4 A	-02 2.38E -03 3.00E -00 0.00E -00 0.00E	-03 2. -02 3. +00 0. +00 0.	B6 73E+0 53E+0 00E+0 00E+0 00E+0	C2	4 8.70E-0 - - 2 4.76E-0 0 0.00E+ 0 0.00E+	03 1.4: 02 2.1: 00 0.00 00 0.00	- 5E-02 - - 4E-01 0E+00 0E+00	- -7.80E-01 - - -1.41E+01 0.00E+00 0.00E+00
Param PER PER PENF PENF RSI NRS	RE RE RRE RRE RRH RRT I F F F F F F F F F F F F F F F F F F	Renew Rene resource Total us Ron rene Non rene Total use Use of Use of re Use of n	Parar rable prir energy wable pi es as ma se of ren energy re ewable p energy ewable p naterial t of non re energy re of secon enewable on renev fue e of net	mary ene carrier imary er taterial util ewable pasources carrier rimary er carrier rimary er carrier enewable ascondary material utilization escondary material expensives as second wable seels fresh war	ergy as ergy ergy ergy ergy as condary fuels condary	Un  [M.  [M.  [M.  [M.  [M.  [M.  [M.  [M	it A  J 5.70  J 0.00  J 5.70  J 7.50  J 0.00  J 7.50  J 0.00	1-A3 DE+0	A4	-02 2.38E -02 2.38E -03 3.00E -00 0.00E -00 0.00E -00 0.00E	-02 3. +00 0. +00 0. -04 1.	B6 73E+0 53E+0 00E+0 00E+0 00E+0 24E+0	C2		02 2.1- 00 0.00 00 0.00 00 0.00 05 1.00	- - 5E-02 - - 4E-01 0E+00 0E+00	-7.80E-01 -1.41E+01 0.00E+00 0.00E+00 0.00E+00 -8.19E-03
Param PER PER PENF PENF PENF SM RSI NRS	RE R	Renew Rene resource Total us Non rene n Total use Use of re Use of n	Parar rable prir energy wable pi es as ma se of ren energy re ewable p energy ewable p naterial t of non re energy re of secon enewable on renev fue e of net	mary ene carrier rimary er exacterial utilization enewable sources dary mate escond wable seeds fresh wa	ergy as ergy lization orimary energy as e primary erial ary fuels condary ter	Un  [M.  [M.  [M.  [M.  [M.  [M.  [M.  [M	it A  J 5.70  J 0.00  J 7.50  J 0.00  J 7.50  J 0.00	1-A3 DE+0	A4	-02 2.38E -02 2.38E -03 3.00E -00 0.00E -00 0.00E -00 0.00E	-03 2. -02 3. +00 0. +00 0. -04 1.	B6 73E+0 53E+0 00E+0 00E+0 00E+0 24E+0	C2 2 4.32E-0 - 3 1.10E-0 0 0.00E+0 0 0.00E+0 0 0.00E+0 0 3.05E-0		03 1.4: 02 2.1: 00 0.00 00 0.00 00 0.00 00 5 1.0:	- - 5E-02 - - 4E-01 0E+00 0E+00	-7.80E-01 -1.41E+01 0.00E+00 0.00E+00 0.00E+00 -8.19E-03
Param PER PER PENF PENF PENF SM RSI NRS FW RESU reade	RE R	Renew Rene resource Total us Ron rene Non rene Total use Use of Use of re Use of n	Pararrate Parameter Suppose Su	mary ene carrier imary er taterial util ewable pasources carrier rimary er carrier rimary er carrier rimary es escond wable se els fresh war a could be coul	ergy as ergy ergy ergy ergy as ergy	Un  [M.  [M.  [M.  [M.  [M.  [M.  [M.  [M	it A  J 5.70  J 0.00  J 7.50  J 0.00  J 7.50  J 0.00	1-A3 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 W	A4  100 -  100 -  100 2.08E-  11 -  100 -  11 1.22E- 12 0.00E- 10 0.00E- 10 0.00E- 12 1.82E- 14 ASTE (	-02 2.38E -02 3.00E -00 0.00E -00 0.00E -00 0.00E -05 2.65E	-03 2. -02 3. +00 0. +00 0. -04 1.	B6	C2	4 8.70E-0 4.76E-0 0.00E+ 0.00E+ 7 2.15E-0	03 1.4 02 2.1 00 0.0 00 0.0		
Param PER PENF PENF PENF SM RSI NRS FW RESU reade	RE R	Renew Rene resource Total us Ron rene Non rene Total use Use of Use of re Use of n	Pararrate Parameter Parame	mary ene carrier rimary er example sources rimary er example per carrier rimary er example sources dary mat execute second wable seels fresh war example example sources dary mat execute seels fresh war example second was	ergy as ergy lization orimary ergy as ergy as ergy as ergy as ergy as ergy arguments. Ergy fuels condary tuels ergy ergy ergy ergy ergy ergy ergy ergy	Un  [M.  [M.  [M.  [M.  [M.  [M.  [M.  [M	it A  J 5.70  J 0.00  J 5.70  J 7.50  J 0.00  J 7.50  J 0.00  J 0.00	1-A3 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0	A4  A4  A4  A4  A4  A4  A4	-02 2.38E -02 2.38E -03 3.00E -00 0.00E -00 0.00E -00 0.00E -00 0.00E -05 2.65E  CATEGO  A5	-03 202 3. +00 0. +00 004 1.  E 2.75	B6	C2	- 4 8.70E-0	03 1.4: 02 2.1: 00 0.00 00 0.00 00 0.00 ASS 3		- 7.80E-01 - 7.80E-01 - 1.41E+01 0.00E+00 0.00E+00 0.00E+00 -8.19E-03 P40
Param PER PER PENF PENF PENF SM RSI NRS FW RESU reade	RE R	Renew Rene resource Total us Ron rene Non rene Total use Use of Use of re Use of n	Pararray rable prirenergy researches se of renergy researches se of renergy researches se of renergy researches se of renergy researches renergy researches son renewable son renevable	mary ene carrier rimary er example sources rimary er example per carrier rimary er example sources dary mat example second wable seels fresh war example example sources dary mat example second wable seels fresh war example second example second example seels fresh war example second example second example seels fresh war example second example secon	nergy as nergy are primary fuels condary ter	Un	it A  J 5.70  J 0.00  J 7.50  J 0.00  J 7.50  J 0.00  J 0.00	1-A3 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0	A4  100 -  100 -  100 2.08E-  11 -  100 -  11 1.22E- 10 0.00E- 10 0.00E- 10 0.00E- 12 1.82E- 14 A4  195E-06	-02 2.38E -02 2.38E -03 3.00E -00 0.00E -00 0.00E -05 2.65E  CATEGO  A5	-03 202 3. +00 0. +00 004 1.  E 2.75	B6	C2	4 8.70E-0 4.76E-0 0.00E+ 0.00E+ 7 2.15E-0 C3 6.60E-06	03 1.4 02 2.1 00 0.0 00 0.0 00 0.0 00 0.0 00 0.0 01 1.57 6 6.05		-7.80E-01 -7.80E-01 -1.41E+01 0.00E+00 0.00E+00 0.00E+00 -8.19E-03 P40  D -3.55E-04
Param PER PER PENF PENF PENF RSI NRS FW RESU reade Param HW NHW	RE R	Renew Rene resource Total us Non rene Non rene Total use Use of re Use of re Use of n	Pararr rable prirenergy wable privenergy see of ren energy re ewable p energy re ewable p energy re ewable p material u of non re energy re of secon enewable on renew fue e of net to pus wast nazardou, dispose tive wast	mary ene carrier rimary er example sources rimary er example per carrier rimary er example sources dary mat example second wable seels fresh war example example sources dary mat example second wable seels fresh war example second example second example seels fresh war example second example second example seels fresh war example second example secon	ergy as hergy lization orimary hergy as hergy as hergy as hergy as hergy as hergy as hergy argumental ary fuels condary term.	Init  (Ma)  (Ma)	it A  J 5.70  J 0.00  J 5.70  J 7.50  J 0.00  J 7.50  J 0.00  J 0.00	1-A3 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0	A4  00  - 00  - 00  2.08E- 01  - 00  - 01  1.22E- 2  0.00E- 00  0.00E- 2  1.82E-  A4  95E-06  51E-05	-02 2.38E -02 2.38E -03 3.00E -00 0.00E -00 0.00E -00 2.65E  CATEGO  A5  2.06E-06 2.29E-03	-03 2.  -02 3.  +00 0.  +00 0.  -04 1.  2.75  1.131	B6	C2	- 4 8.70E-0	03 1.4: 02 2.1: 00 0.00 00 0.00 00 0.00 00 1.57 0 6.05 0 8.61		
Param PER PER PENF PENF PENF RSI NRS FW RESU reade Param HW NHW RW	RE R	Renew Rene resource Total use Non rene Non rene Use of re Use of re Use of n Radioact Comp	Parametrial LCA  Parame	mater mary ene carrier rimary er exable pesources rimary er carrier rimary er carrier rimary er carrier rimary er date se sources dary mat expected expected expected fresh wa  ter expected dispose det dispose det dispose	ergy as hergy lization orimary hergy as hergy fuels condary fuels condary ter hergy as hergy fuels condary fuels fuel fuels f	Un	it A  J] 5.77  J] 0.00  J] 7.56  J] 7.57  J] 0.00  J] 7.59  J] 0.00  J] 0.00  J] 3.33  JS ANI  A1 - A3  3.66E-03  1.26E-03  3.03E-03	1-A3 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0	A4  100 -  100 -  100 2.08E-  101 -  100 -  101 1.22E-  102 0.00E-  103 0.00E-  104 0.00E-  105 1.82E-  106 0.51E-05  1.54E-06	A5 -02 2.38E -02 2.38E -03 3.00E -00 0.00E -00 0.00E -00 0.00E -00 2.65E  CATEG  A5	-03 2.  -02 3.  +00 0.  +00 0.  +00 0.  2.75  1.131  2.91  0.000	B6	C2  - 2 4.32E-0  - 3 1.10E-0 0 0.00E+0 0 0.00E+0 0 0.00E+0 0 3.05E-0  The piece  C2 2.50E-08 1.38E-06 1.44E-08	4 8.70E-0  4 8.70E-0  0 0.00E+  0 0.00E+  0 0.00E+  1.54E-05  6.86E-06  0.00E+00	03 1.4: 02 2.1: 00 0.00 00 0.00 00 0.00 00 1.57 6 6.05 6 8.61 0 0.00		
Param PER PER PENF PENF PENF SM RSI NRS FW RESU reade Param HW NHW RW CRI MF	RE R	Renew Rene resource Total use Non rene Non rene Use of re Use of ne Use of ne Comp Radioact Comp Materials	Pararray rable prirenergy wable pes as masse of renergy researches energy researches energy researches energy researches of non renergy re of secon enewable on renevable on renevable on renevable on renevable ous waste nazardou dispose tive wast onents for rials for r for ener	mary ene carrier rimary er example sources rimary er example sources rimary er example sources dary mat execute second wable se els fresh war example example sources dary mat execute sources dary mat execute second wable se els fresh war example sources dary mat execute example sources dary mat execute example sources was example sources and example sources was example sources.	rigy as hergy lization primary hergy as hergy as hergy as hergy as hergy as hergy as herial ary fuels condary ter hergy lie light for the hergy li	Un	it A  J 5.70  J 0.00  J 5.70  J 7.50  J 0.00  J 7.50  J 0.00  J 0.00  J 0.00  A1 - A3  3.66E-0:  1.26E-0:  3.03E-0:  0.00E+0  0.00E+0  0.00E+0	1-A3 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0	A4 00 - 00 - 00 2.08E- 01 1.22E- 02 0.00E- 03 0.00E- 04 1.82E- 05 1.82E- 05 1.84E-06 05 1.84E-06 00E+00 00E+00 00E+00	A5 -02 2.38E -03 3.00E -00 0.00E -00 0.00E -00 0.00E -00 2.65E  CATEGO  A5 2.06E-06 2.29E-03 1.75E-06 0.00E+00 6.41E-02 0.00E+00	-03 203 203 2. +00 0. +00 004 1. 1.131 2.91 0.000 0.000	## B6	C2	- 4 8.70E-0	03 1.4: 02 2.1: 00 0.00 00 0.00 00 0.00 00 0.05 1.0: 0 1.57 0 6.05 0 8.61 0 0.00 0 0.00 0 0.00		-7.80E-01 -7.80E-01 -1.41E+01 0.00E+00 0.00E+00 -8.19E-03 P40  D -3.55E-04 -3.60E-02 -4.41E-04 0.00E+00 0.00E+00
Param PER PER PENF PENF PENF RSI NRS FW RESU reade Param HW RW CR	RE R	Renew Rene resource Total use Non rene Non rene Use of re Use of n  Hazardo Non h  Radioact Comp Mater Materials Exporte	Pararrayable prince energy researches as masses of renergy researches energy researches energy researches energy resort second enewable on renergy resort second enewable on renewable on renewable energy resort second enewable energy resort second energy resort second energy resort second energy resort energy	mary ene carrier rimary er example per sources rimary er example per sources rimary er example per exa	ergy as hergy lization orimary as hergy fuels condary tuels condary tuels condary tuels [I] ed [I] ed [I] ed [I] ed [I] ed [I]	Un	it A  J 5.70  J 0.00  J 7.50  J 0.00  J 7.50  J 0.00  J 0.00  J 0.00  J 0.00  A1 - A3  3.66E-0:  1.26E-0:  3.03E-0:  0.00E+0  0.00E+0	1-A3 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0 DE+0	A4  00 -  00 -  00 2.08E-  01 1.22E-  2 0.00E-  00 0.00E-  2 1.82E-  A4  95E-06  51E-05  54E-06  00E+00  00E+00	A5 -02 2.38E -003 3.00E -000 0.00E -000 0.00E -000 0.00E -005 2.65E  CATEGO  A5 2.06E-06 2.29E-03 1.75E-06 0.00E+00 6.41E-02	-03 202 3. +00 0. +00 0. +00 004 1. 1.13i 2.91 0.00i 0.00i 0.00i 0.00i	B6	C2	4 8.70E-0	02 2.1. 00 0.00 00 0.00 00 0.00 00 1.57 6 6.05 6 8.61 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00		



# 6. LCA: Interpretation

This chapter contains an interpretation of the Life Cycle Impact Assessment categories. Stated percentages in the whole interpretation are related to the overall life cycle, excluding credits (module D).

The production stage (modules A1-A3) contributes between 1% and 5% to the overall results for all the environmental impact assessment categories hereby considered, except for the abiotic depletion potential (ADPE), for which the contribution from the production stage accounts for app. 94% - 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 stage, the main contribution for all the impact categories is the production of electronics mainly due to the energy consumption on these processes. Plastics account with 62% to the overall mass of the product; therefore, the impacts are

not in line with the mass composition of the product. The environmental impacts for the transport (A2) have a negligible impact within this stage.

To reflect the use stage (module B6), the energy consumption was included and it has a major contribution for all the impact assessment categories considered - between 94% and 99%, with the exception of ADPE (6%). This is a result of 23 hours of operation in stand-by mode and 1 hour in on mode per day and per 365 days in a year.

In the end-of-life stage, there are loads and benefits (module D, negative values) considered. The benefits are considered beyond the system boundaries and are declared for the recycling potential of the metals and for the credits from the incineration process (energy substitution).

# 7. Requisite evidence

Not applicable in this EPD.

# 8. References

#### **Institut Bauen und Umwelt**

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

# **General principles**

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

#### **IBU PCR Part A**

IBU 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 Electronic Access Control Systems. <a href="https://www.bau-umwelt.com">www.bau-umwelt.com</a>

# GaBi 6 2013

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

#### GaBi 6 2013D

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

#### ISO 14001

ISO 14001:2009-11: Environmental management systems - Requirements with guidance for use

#### ISO 14025

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

# ISO 9001

ISO 9001:2008: Quality management systems - Requirements

#### EN 15804

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

# **RoHS Conformity:**

RoHS Conformity: EN50581:2012 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

#### UL294/cUL

The Standard of Safety for Access Control System Units

# UL94

Flame Rating of HB

#### EN60950



EN60950-1: 2006/ All: 2009 +A1:2010 +A12:2011 Information technology equipment - Safety - Part1: General requirements

# EN 301 489

EN 301 489-1 V1.9.2 : Common Technical requirements

**EN 301 489-3 V1.6.1**: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz

#### EN50130

EN50130-4:2011 : Alarm systems - Electromagnetic compatibility and Environmental test methods

#### **ETSI EN 300**

ETSI EN 300 330-2 V1.5.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

#### **ETSI EN 302**

ETSI EN 302 291-2 V1.1.1 : Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Close Range Inductive Data Communication equipment operating at 13,56 MHz; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive

#### EN 50581

EN 50581: 2012 Guiding Standard for Compliance with RoHS2 Technical Documentation Requirements FCC Certification: 47 CFR §15.225: 2011 Operation within the band 13.110-14.010 MHz

# **RSS-210**

RSS-210 Issue 8: 2010 License-exempt Radio Apparatus (All Frequency Bands): Category I Equipment - Spectrum Management and Telecommunications Radio Standards Specification



# 9. Annex

Results shown below were calculated using TRACI Methodology.

DESC	CRIP	TION O	F THE	SYST	EM B	DUND	ARY (	X =	INCL	UDE	D IN	LCA	\;	IND =	= MOD	ULE N	от і	DECLA	RED)
														В					FITS AND
PROD	DUCT	STAGE	ON PROCESS				US	TAGE				END OF LIFE STAGE					OADS OND THE		
			STA	AGE	USE STAGE									END OF EIR E OFFICE				SY	'STEM
																		BOU	NDARYS
<u>_</u>		<u>g</u>	Transport from the gate to the site			ø.		Ę	F	<u>.</u>	Operational energy use	ater		e G		sing			
Raw material supply	ort	Manufacturing	rom e si	bly		Maintenance	·≒	Replacement <sup>1)</sup>	Refurbishment <sup>1)</sup>	. We	en	NS I		De-construction demolition	ort	Sess	sal	ф 3	Recovery- Recycling- potential
w mate supply	Transport	fact	ransport from th gate to the site	Assembly	Use	ten	Repair	cer		IISI	onal	one	nse	-constructi demolition	Transport	prod	Disposal	Reuse-	Recycling potential
aw sı	Ta	ann	ispo	Ass		lain	Ω.	epla	-   -	בין בין	ratic	rati		ᅙ	Tra	ste	ĕ	ا مع ا	Rec
~		Ž	rar ga			2		å	Re	Ϋ́	)pel	Operational water	-	De		Waste processing			
A1	A2	A3	A4	A5	B1	B2	В3	B4	I E	35	B6	B7	7	C1	C2	C3	C4	ı	D
Х	Х	Х	Х	Х	MND	MND	MND	MN	D M	ND	Χ	MN	D	MND	Х	Х	Х		X
RESU	JLTS	OF TH	IE LCA	A - ENV	IRON	MENT	AL IM	PAC	CT: O	ne p	oiece	of i	CL/	ASS S	SE RP4	0 reac	ler		
Parame	Parameter		Parameter			Unit		A1 - A3			A5		В6	;	C2	СЗ		C4	D
GWP		Global warming potential			[kg CO <sub>2</sub> -Eq.]		4.95E+00		9.48E	-02 9	9.12E-02		2.42E+02		.94E-04	2.68E-0	3 4	41E-01	-1.15E+00
ODP		Depletion potential of the			[kg CFC11-Eq.]						4.44E-13		8.90E-08		.04E-15				-1.38E-10
		stratospheric ozone layer Acidification potential of land							4.04L	-10 4	T.77L			-00 4	.04L-13			30L-12	-1.30L-10
AP		and water			[kg SO <sub>2</sub> -Eq.]		2.98E-02		2.10E	-03 2	2.52E-05		7.64E-01		.75E-06	1.19E-0	)5 1.	35E-04	-1.07E-02
EP		Eutrophication potential			[kg N-eq.]		4.26E	4.26E-03		-05 1	1.45E-06		3.75E-02		.36E-07	5.08E-07		36E-06	-2.76E-04
Smog		Ground-level smog formation potential			[kg	[kg O <sub>3</sub> -eq.]		3.95E-01		-02 5	5.88E-04		6.51E+00		.78E-05	1.08E-04		15E-03	-1.13E-01
Resour	rces F	Resources – fossil resources			[	[MJ]		6.16E+00		-01 3	1 3.00E-03		1.64E+02		.58E-03	2.16E-03		98E-02	-8.98E-01
RESU	JLTS	OF TH	IE LCA	- RES	OUR	CE US	E: On	e pi	ece c	of iCl	LASS	SE	RP	40 re	ader				
Paran	neter			Unit	A1	A1 - A3		4	A5		В	B6 C2		СЗ		C4	D		
PEF	RE	Renewable primary energy energy carrier				[MJ]	5.70	0E+00 -		-	-		-		-	-		-	-
PEF	RM		wable pres as ma		[MJ]	0.00	0.00E+00		-	-					-		-	-	
PERT		Total us	se of ren				5.70E+00		E-02	2.38E-03 2.73		.73E	BE+02 4.32E-04		8.70E-03		.45E-02	-7.80E-01	
PENRE			ewable p energy	ergy as	[MJ]	[MJ] 7.50		01 -		-		-			-		-	-	
PENRM		Non rene		ergy as	[MJ]	0.00	0.00E+00		_	_				_	_		_		
		material utilization  Total use of non renewa			able									- 00 4 405 00		4 705 00			
PENRT		primary energy resource				[MJ]					3.00E-02								
SN	SM		Use of secondary mater Use of renewable second					2.88E-02		Ξ+00	0.00E+00		0.00E+00		0.00E+00	0.00E+	00 0.	00E+00	0.00E+00
RS	RSF USE		fuels		ndary	[MJ]	0.00E+00		0.001	Ξ+00	0.00E+00		0.00E+00		.00E+00	0.00E+	00 0.	00E+00	0.00E+00
NRS	NRSF		e of non renewable seco fuels			ndary [MJ]		0.00E+00		0.00 OE+00		+00 0.00		E+00 0	.00E+00	0.00E+00		00E+00	0.00E+00
FV	FW		Use of net fresh water			[m³]	3.34	E-02	1.82	E-05	2.65E	-04 1	.24E	E+00 3	3.05E-07	2.15E-0	05 1.	.08E-03	-8.19E-03
		OF TH	IE LCA	\	ΓPUT	FLOW	S AN	D W	ASTI	E CA	TEG	ORII	ES:	One	piece	of iCL	ASS	SE R	P40
reade			D-				Heit		4 40			۸-		DC	- 00		.	04	
Param		Parameter					Unit		1 - A3	A4		A5		B6	C2	С		C4	D
HW		Hazardous waste disposed									E-06 2.06E-					_			
NHW RW		Non hazardous waste disposed  Radioactive waste disposed					[kg]	-		-01 6.51E-05 2. -03 1.54E-06 1.					_				
CRI		Components for re-use					[kg] [kg]	-		E+00 0.00E+00 0.0					_				
MFR		Materials for recycling					[kg]	_		0E+00 0.00E+00 0									
MER		Materials for energy reco				y	[kg]	-					-00 0.00E+00 0.0		-				
EEE		Exported electrical energy					[MJ]	_						0.00E+00 0.00E+		-			
		Exported thermal energy								0.00E+00 3.			, i jo.	.00_+0	0.000		1	3.00L-01	1





# **Publisher**

Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany Tel +49 (0)30 3087748- 0 Fax +49 (0)30 3087748- 29 Mail info@bau-umwelt.com Web www.bau-umwelt.com



# Programme holder

Institut Bauen und Umwelt e.V. Tel +4
Panoramastr 1 Fax +4
10178 Berlin Mail inf
Germany Web w





# Author of the Life Cycle Assessment

thinkstep AG
Hauptstraße 111
70771 Leinfelden-Echterdingen
Germany

Tel
Fax
Hauptstraße 111
Fax
Web
Web

Tel +49 711 34 18 17 22 Fax +49 711 34 18 17 25 Mail web www.thinkstep.com



# Owner of the Declaration

ASSA ABLOY (HID Global) 611 Center Ridge Drive Austin, TX 78753 USA Tel 512-776-9000 Internet www.hidglobal.com