

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	ASSA AB - an ASSA ABLOY Group company
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ASA-20130277-IBC1-EN
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Valid to	20.02.2019

ASSA AB

ASSA Motor lock 850

Motor driven hook bolt lock for high security and perimeter doors




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



Institut Bauen
und Umwelt e.V.



1. General Information

<p>ASSA AB - ASSA ABLOY Group</p> <p>Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany</p> <hr/> <p>Declaration number EPD-ASA-20130277-IBC1-EN</p> <hr/> <p>This Declaration is based on the Product Category Rules: Locks and fittings , 07-2012 (PCR tested and approved by the independent expert committee)</p> <hr/> <p>Issue date 21.02.2014</p> <hr/> <p>Valid to 20.02.2019</p> <hr/> <p></p> <hr/> <p>Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)</p> <hr/> <p></p> <hr/> <p>Dr. Burkhard Lehmann (Managing Director IBU)</p>	<p>ASSA Motor lock 850</p> <hr/> <p>Owner of the Declaration ASSA AB Kungsgatan 71 Post Box 371 631 05 Eskilstuna Sweden</p> <hr/> <p>Declared product / Declared unit The declaration represents 1 Motor lock ASSA 850 version for 50mm backset.</p> <hr/> <p>Scope: This EPD is based on the full lifecycle of 1 ASSA 850 - 50mm backset - motor lock. Data was collected from the lock case manufacturer in Bucharest (Romania) and from assembly/packaging at ASSA in Sweden. 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.</p> <hr/> <p>Verification</p> <table border="1"> <tr> <td colspan="2">The CEN Norm EN 15804 serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration and data according to ISO 14025</td> </tr> <tr> <td><input type="checkbox"/> internally</td> <td><input checked="" type="checkbox"/> externally</td> </tr> </table> <hr/> <p></p> <hr/> <p>Dr.-Ing. Wolfram Trinius (Independent tester appointed by SVA)</p>	The CEN Norm EN 15804 serves as the core PCR		Independent verification of the declaration and data according to ISO 14025		<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally
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2. Product

2.1 Product description

The Motor lock, ASSA 850, is an automatic, motor driven sash lock. It has a latch bolt and hook bolt and is used for doors equipped with lever handles. ASSA 850 lock has a built in management program making it possible to integrate to electronic access control system hardware and reduce the number of electronic control boxes required in a door installation.

2.2 Application

The locks are designed for single or double leaf door. The door can be arranged as swing or sliding doors. The locks are typically installed in commercial buildings, such as department stores, requiring high security and/or perimeter security doors controlled and monitored by a security management system, e.g. alarm system or electronic access control system (EAC-system). The motor locks can be installed indoors and outdoors. They are designed to be installed inside the door frame, e.g. mortise lock.

2.3 Technical Data

The following table lists the technical properties of the product:

Name	Value	Unit
Dimensions 850-backset 50 mm (W*H*D)	15x7,5x1,9	cm
Weight	850	g
Supply voltage	12 - 24	VDC
Power consumption (Stand-by)	1,2	W
Power consumption (Idle)	3,6	W
Power consumption (Peak)	9,6	W
Temperature (Operating)	-40 to +70	deg C
Temperature (Storage)	-40 to +70	deg C

The locks have minimal standby power consumption regardless of state, locked or unlocked and the duty cycle is less than 0.3 s.

2.4 Placing on the market / Application rules

For the marketing in the EU/EFTA the Regulation (EU) No 305/2011 dated from 9 March 2011 applies. The products need a Declaration of Performance taking into consideration DIN EN 14846: Building hardware - Locks and latches - Electromechanically operated locks and striking plates - Requirements and test methods and the CE-marking. For the application and use the respective national provisions apply.

2.5 Delivery status

Delivered as set with control unit, striking plate and installation cable, or as separate lock case. Delivered in box size 230mm x 105mm x 24mm (separate lock) or 590 mm x 170 mm x 57 mm (set).

2.6 Base materials / Ancillary materials

The composition of the ASSA 850 lock in percentage (%) of total mass per unit (excluding packaging) is as following:

Component	Percentage in mass (%)
Steel	66
Stainless steel	15
Zinc	17
Electronic	2
Plastic	1
Total	100

2.7 Manufacture

Products are provided by Tier-1 supplier in Romania which is ISO 9001:2008 certified. The electronics are produced in China and the mechanics in Romania. The components come from processes such as stamped steel, zinc and steel casting. Final assembly takes place in Sweden.

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

- Routinely monitoring our environmental operations, Green House Gases (GHG), energy, water, waste, Volatile Organic Compounds (VOC), surface treatment and Health&Safety (H&S). Conduct periodic inspections, audits, and reviews to ensure that we meet applicable standards and to evaluate our Environment Management program effectiveness
- Code of Conduct covers human rights, labor practices and decent work. Personnel are aware of their environmental roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance. The production site meets /OHSAS 18001/ and /ISO 14001/
- Employees' safety is assured by implemented dust and ventilation extract systems for applicable processes. Waste metals are collected and separated for recycling.

2.9 Product processing/Installation

ASSA 810 locks 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

All packaging is fully recyclable. The packaging material is composed by cardboard (app. 70%) and plastic foil (app. 30%).

2.11 Condition of use

Annual maintenance of hook bolt and latch to maintain low friction and secure latching is 1g of grease, applied to contact surfaces of hook bolt and latch (if applicable). No cleaning. Locks 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

The reference service life of 10 years is based on a typical installation of an ASSA 850 as a security lock 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 200,000 cycles in accordance with EN 14846.

2.14 Extraordinary effects

Fire

Suitable for use in fire and smoke doors /EN 14846/

Water

Contains no substances that have an impact on water in case of flooding. Electric components and functionality may be jeopardized in the event of flooding.

Mechanical destruction

No impact on human health and environment is known or expected. Especially no hazardous substance can be anticipated in case of a mechanical destruction.

2.15 Re-use phase

It is possible to re-use the product during the reference service life and it can be moved from one door to another. The major materials, by mass, are steel, stainless steel, and zinc, which can be recycled. The plastic components can be used for energy recovery in an incineration process. The lock can either be sent back to ASSA for recycling or to a professional recycling service provider.

2.16 Disposal

Waste codes according to European Waste Catalogue and Hazardous Waste List - Valid from 1 January 2002.

Manufacturing:

/EWC 12 01 01/ Ferrous metal filings and turnings
/EWC 12 01 03/ Non-ferrous metal filings and turnings.

Packaging:

All materials incurred during Installation on their end-of-life are directed to a recycling unit.
/EWC 15 01 01/ paper and cardboard packaging
/EWC 15 01 02/ plastic packaging.

End of life:

All materials on their end-of-life can be directed to a recycling unit.
/EWC 16 02 14/ discarded Equipment other than those mentioned in 16 02 09 to 16 02 13.
/EWC 16 02 16/ components removed from discarded equipment other than those mentioned in 16 02 15.
/EWC 17 04 05/ iron and steel.

2.17 Further information

For further information contact:
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+4616177000
or ASSA website www.assa.se

3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of Motor Lock 850 as specified in Part B requirements on the EPD for Doors, windows, shutters, and related products/IBU PCR Part B/.

Declared unit

Name	Value	Unit
Declared unit	1	piece of motor lock
Mass (total system)	0.935	kg/piece
Conversion factor to 1 kg	1.08	

3.2 System boundary

Type of the EPD: cradle to gate - with Options
The following life cycle phases were considered for Motor Lock:

A1-A3 Production phase:

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

A4-A5 Construction phase:

- A5 – Packaging waste processing

The use phase:

- B2 - Maintenance (greasing of the locks)

Use phase related to the operation of the building includes:

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

End-of-life phase:

- 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

Transport:

Real-world data on mode of transport and distances, as reported by suppliers, were used for those materials and parts contributing more than 2% of total product mass. For parts and materials, contributing less than

2% to the total product mass, transport by road over an average distance of 500km was assumed.

Use phase:

For the use phase, it is assumed that the lock is used in the European Union, thus an European electricity grid mix is considered within this phase. According to the most representative scenario, the operating hours of the product are accounted for 2400 hours per year; power consumption is 3 W.

EOL:

In the End-of-Life phase a recycling scenario with 100% collection rate was assumed.

3.4 Cut-off criteria

In the assessment, all available data from production process were 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).

For raw materials, contributing more than 2% to the total product mass, means of transportation and distances were modeled in more detail to better reflect the reality; for materials or product parts, contributing less than 2% of total product mass, average distances and traditional means of transport were assumed. Average distance assumptions were based on following thoughts:
- within one country – max. transport distance of 500 km;
- between two countries/regions – average distance between these countries/regions.
- Several supplier countries – weighted average distances.

The overall contribution derived from these assumptions does not exceed 5% to the impact categories under consideration. Impacts relating to the production of machines and facilities required during production are out of the scope of this assessment.

3.5 Background data

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

3.6 Data quality

The requirements for data quality and background data correspond to the specifications of the /IBU PCR PART A/. PE INTERNATIONAL performed a variety of tests and

checks during the entire project to ensure high quality of the completed project. This obviously includes an extensive review of project-specific LCA models as well as the background data used.

The technological background of the collected data reflects the physical reality of the declared products. The datasets are complete and conform to the system boundaries and the criteria for the exclusion of inputs and outputs.

All relevant background datasets are taken from the /GaBi 6/ software database. The last revision of the used background data has taken place not longer than 10 years ago.

3.7 Period under review

The period under review is 2012/13 (12 month average).

3.8 Allocation

Regarding incineration, the software model for the waste incineration plant (WIP) is adapted according to the material composition and heating value of the

combusted material. Following specific life cycle inventories for the WIP are considered:

- Waste incineration of plastic from packaging
- Waste incineration of paper from packaging
- Thermal treatment of plastic parts
- 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 each background dataset is available in the corresponding 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

In the EPD scenarios and/or technical information for modules A5, B2, B6, C1-C4 and D are given.

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site packaging (plastic and paper)	0.101	kg

Maintenance (B2)

Name	Value	Unit
Other resources lubricants	0,001	kg/a

Reference service life

Name	Value	Unit
Reference service life	10	a

Operational energy use (B6)

Name	Value	Unit
Electricity consumption (during lifetime)	72	kWh

Total energy consumed during the whole product life was calculated using following formula:

$$(W_active_mode * h_active_mode + W_idle_mode * h_idle_mode + W_stand_by_mode * h_stand_by_mode) * Life_span * days_year * 0.001$$

Where:

W_active_mode - Energy consumption in active mode in W

h_active_mode - Operation time in active mode in hours

W_idle_mode - Energy consumption in idle mode in W

h_idle_mode - Operation time in idle mode in hours

W_stand_by_mode - Energy consumption in stand-by mode in W

h_stand_by_mode - Operation time in stand-by mode in hours

Life_span - Reference service life of product

days_year - Operation days per year

0.001 - Conversion factor from Wh to kWh.

End of life (C1-C4)

Name	Value	Unit
Collected separately steel, stainless steel, zinc, electronic	0.747	kg
Collected as mixed construction waste for landfilling	0.074	kg
Recycling steel, stainless steel, zinc, electronic	0.747	kg
Landfilling construction waste	0.074	kg

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

Name	Value	Unit
Collected separately waste ASSA Motor lock 810 (including packaging)	0.935	kg
Recycling Steel	52	%
Recycling Stainless steel	13	%
Recycling Zinc	14	%
Recycling/Reuse Electronic (PWB)	2	%
Reuse Paper packaging (from A5)	8	%
Reuse Plastic packaging (from A5)	3	%
Construction waste going to landfill	8	%

5. LCA: Results

The Table below shows the LCA results for the declared unit - 1 piece of ASSA Motor lock 850, 50 mm backset.

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 BOUNDARIES
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	MND	X	MND	X	MND	MND	MND	X	MND	MND	X	X	X	X	

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: declared unit and product

Parameter	Unit	A1-A3	A5	B2	B6	C2	C3	C4	D
GWP	[kg CO ₂ -Eq.]	7.86E+0	1.71E-1	-1.64E-2	3.47E+1	2.22E-2	4.66E-3	5.16E-3	-2.24E+0
ODP	[kg CFC11-Eq.]	1.27E-9	4.04E-12	5.11E-12	3.11E-8	3.88E-13	4.18E-12	9.62E-13	-1.35E+0
AP	[kg SO ₂ -Eq.]	5.39E-2	4.42E-5	1.40E-4	1.64E-1	1.01E-4	2.20E-5	7.66E-6	-1.72E-2
EP	[kg (PO ₄) ³⁻ -Eq.]	3.92E-3	5.86E-6	5.41E-5	8.65E-3	2.32E-5	1.16E-6	1.17E-6	-9.80E-4
POCP	[kg Ethen Eq.]	3.63E-3	3.80E-6	3.04E-6	9.67E-3	-3.30E-5	1.30E-6	1.99E-6	-1.22E-3
ADPE	[kg Sb Eq.]	1.59E-3	6.50E-9	2.94E-9	4.77E-6	8.28E-10	6.41E-10	4.50E-10	-1.08E-3
ADPF	[MJ]	9.21E+1	1.03E-1	1.02E-1	3.94E+2	3.07E-1	5.29E-2	1.68E-2	-2.40E+1

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: declared unit and product

Parameter	Unit	A1-A3	A5	B2	B6	C2	C3	C4	D
PERE	[MJ]	8.34E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERM	[MJ]	1.58E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	9.92E+0	6.43E-3	3.37E-1	1.02E+2	1.21E-2	1.37E-2	1.30E-3	-1.61E+0
PENRE	[MJ]	1.02E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRM	[MJ]	1.30E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	[MJ]	1.03E+2	1.14E-1	1.06E-1	6.12E+2	3.08E-1	8.22E-2	1.75E-2	-2.54E+1
SM	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m ³]	4.16E+1	4.75E-1	2.02E-1	2.74E+2	1.34E-2	3.68E-2	-3.30E-2	-8.76E+0

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: declared unit and product

Parameter	Unit	A1-A3	A5	B2	B6	C2	C3	C4	D
HWD	[kg]	1.68E-2	6.88E-3	4.56E-6	0.00E+0	0.00E+0	0.00E+0	1.25E-5	3.36E-3
NHWD	[kg]	3.54E-1	1.28E-3	9.87E-4	2.67E-1	3.99E-5	3.58E-5	8.88E-2	-3.57E-2
RWD	[kg]	4.32E-3	4.59E-6	1.53E-6	8.99E-2	4.28E-7	1.21E-5	3.13E-7	-5.73E-4
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-
MFR	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-
EEE	[MJ]	0.00E+0	2.54E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.13E-2	-
EET	[MJ]	0.00E+0	7.06E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.44E-2	-

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. When expressed as a percentage, the impact refers to its magnitude expressed as a percentage of total product impact across all modules, with the exception of

module D.

Production phase (module A1-A3) contributes 4% to total impact assessment for Depletion Potential of the Stratospheric Ozone Layer (ODP) category and almost

100% - for Abiotic Depletion Potential for Non Fossil Resources (ADPE). For all other categories this values ranges between 18% and 31%. The environmental impacts for the transport (A2) have a negligible impact within this stage.

To reflect the use phase corresponding to the RSL stated in this EPD, energy consumption was considered and has a major contribution for each

impact assessment category between 68% and 96%, with exception of ADPE (0.3%).

In module D the benefits (negative values) and loads beyond the system boundary are declared for the recycling potential of the metals and for the credits from the incineration process (energy substitution) within A5.

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

ISO 14025

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

EN 15804

EN 15804:2012-04: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

EMC directive (2004/108/EC)

EMC directive (2004/108/EC): Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC.

DIN EN 14846

DIN EN 14846: Building hardware - Locks and latches - Electromechanically operated locks and

striking plates - Requirements and test methods; German version EN 14846:2008.

ISO 9001:2008

Quality management systems - Requirements (ISO 9001:2008).

OHSAS 18001

Arbeits- und Gesundheitsschutz-Managementsysteme - Leitfaden für die Implementierung von OHSAS 18001

DIN EN ISO 14001

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

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

GaBi 6 2013

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

GaBi 6 2013D

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



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