

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

| | |
|--------------------------|--------------------------------------|
| Owner of the Declaration | Abloy Oy |
| Programme holder | Institut Bauen und Umwelt e.V. (IBU) |
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Door Closer - DC 500 & DC700
ASSA ABLOY

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







Institut Bauen
und Umwelt e.V.



ASSA ABLOY

1. General Information

| ASSA ABLOY | Door closer – DC 500 & DC700 | | | | | | |
|---|--|--|--|---|--|-------------------------------------|--|
| <p>Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany</p> | <p>Owner of the Declaration Abloy Oy Wahlforsinkatu 20, 80100 Joensuu, Finland</p> | | | | | | |
| <p>Declaration number EPD-ASA-20130275-IBC1-EN</p> | <p>Declared product / Declared unit The declaration represents 1 Cam-Motion door closer (DC500 / DC700 series), consisting of the following items:</p> <ul style="list-style-type: none"> - A closer body - A guide rail - Accessories | | | | | | |
| <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> | <p>Scope: This declaration and its LCA study are relevant to ASSA ABLOY DC500 and DC700 series door closers. The primary manufacturing processes are made by external suppliers and the final manufacturing processes and assembly for all door closer components occur at our manufacturing factory in Joensuu, Finland. 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> | | | | | | |
| <p>Issue date 21.02.2014</p> | <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> | 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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| <p>Valid to 20.02.2019</p> | <p></p> | | | | | | |
| <p></p> <p>Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)</p> | <p></p> <p>Dr.-Ing. Wolfram Trinius (Independent tester appointed by SVA)</p> | | | | | | |
| <p></p> <p>Dr. Burkhard Lehmann (Managing Director IBU)</p> | | | | | | | |

2. Product

2.1 Product description

The DC700 & DC500 Cam-Motion® door closers are CE-marked and characterized by

- Cam-Motion® technology, which reduces counter-pressure when opening the door, making it easier to operate
- Fulfillment of barrier-free building requirements /Equality Act & CEN/TR15894
- Cam-Motion® Door Closers are suitable for installation in all four mounting positions
- Cam-Motion® Door Closers help to save energy in all seasons, optimizing the thermal efficiency of the door opening
- Height-adjustable pinion connection between door closer and arm
- A uniform attractive design across the entire product range gives buildings style and aesthetic Appeal throughout the building
- Variable adjustable closing force

- Adjustable back-check which offers optimum protection for doors, walls and users to pass through the door
- Adjustable delayed closing which is important for situations where extended closing time is needed for passing through a door
- Integrated, concealed mounting plate available
- Height-adjustable guide rail Option, for ease of installation
- Thermodynamic valves for consistent performance across a wide temperature range
- Wide range of accessories

This EPD is applicable to DC500, DC700, DC700AC and DC700DA.

2.2 Application

The ASSA ABLOY Cam-Motion overhead door closers DC500 and DC700 are ideal for a wide range of

applications – from private to commercial and public sectors both light and heavy:

- Fire & smoke protection and standard doors
- For interior doors
- For exterior doors it is recommended to use a door closer of DC700 series
- All four alternative mounting positions enabled on single leaf doors as standard, to frame or door leaf on hinge or non-hinge side

2.3 Technical Data

The information in the table below represents the technical properties for door closer of the types DC 500 and DC 700.

| | |
|-----------------------------------|--|
| Adjustable closing force | EN1-4 (DC500) EN3-6 (DC700/DC700AC) |
| Door width up to | 1100mm (DC500) 1400mm (DC700/DC700AC) |
| Fire and smoke protection | Yes |
| DIN door swing directions | Left/right handed |
| Closing speed | Variable between 170°-10° |
| Latching speed | Variable between 10°-0° |
| Backcheck | Variable above 70° |
| Opening angle, hinge side (DC700) | ca. 170° (DC500/DC700) 180° (DC700AC) |
| Opening angle non-hinge side | ca. 120° |
| Weight | 2,7kg |
| Height | 64mm |
| Depth | 57mm |
| Length | 270mm |
| Certified in compliance with | EN1154 |
| CE marking for building products | yes |

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 /EN 1154:1996/A1:2002/AC:2006 / – Building hardware -Controlled door closing devices/ and the CE-marking. DC700, DC500 and relevant accessories are certified according to these standards. For the application and use the respective national provisions apply

2.5 Delivery status

Door closer units and guide rail arms are delivered ready for installation in separate packages. The door closer unit including the packaging has the following dimensions: 330mm x 80mm x 73mm. The guide rail arm has the following dimensions: 540mm x 35mm x 45mm.

2.6 Base materials / Ancillary materials

The average composition for ASSA ABLOY DC500/DC700, including the guide rail arm and packaging is as following:

| Component | Percentage in mass (%) |
|--------------|------------------------|
| Aluminum | 40.3 |
| Steel | 48.3 |
| Plastic | 3.6 |
| Oil | 3.2 |
| Other | 4.4 |
| Total | 100.0 |

2.7 Manufacture

The primary manufacturing processes are made by Tier - 1 suppliers and the final manufacturing processes for door closer units occur at the factory in Joensuu, Finland.

Manufacturing of the door closer unit consists of machining, die casting, component manufacturing (springs, bearings, O-rings). Final manufacturing process includes assembly, testing, painting, and packing of the door closer. Guide rail arms are processed in profile extruding, cutting, welding, painting and assembly phases.

The factory of Joensuu 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.

- Routinely monitoring of our environmental operations, Green House Gas (GHG), energy, water, waste, Volatile Organic Compound (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 factory of Joensuu has certification of Environmental Management according to /ISO 14001:2004/ and Occupational Health and Safety to /OHSAS 18001:2007/.
- Any waste metals during machining are separated and recycled. The waste from the water-based painting process is delivered to a waste treatment plant.

2.9 Product processing/Installation

ASSA ABLOY DC500/DC700 door closers are distributed through and installed by trained installation technicians, such as locksmiths, carpenters etc. adhering to local/national standards and requirements.

Door and frame preparations are made in door manufacturer's production sites.

2.10 Packaging

ASSA ABLOY DC500/DC700 door closers are packed in cardboard packaging. Packaging includes two paper sheets (installation instruction and drilling template) – all of which are fully recyclable.

80% of carton is made from recycled material.
100% of paper documents are made from recycled material.

2.11 Condition of use

Annual inspection is recommended in order to guarantee correct functionality of the product and the door leaf. The inspection includes: checking, fixing screws to ensure they are properly tight, correct adjustments (closing speeds, force), compliance with local legal inspection standards and greasing all the moving parts of the arm.

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

Door closer units are normally installed by trained technicians. In any case the installation must be done in line with instructions provided by the manufacturer. ASSA ABLOY DC500/DC700 were developed to comply with /EN1154/ standard and quality requirements. The typical life time of a DC500/DC700 is 15-20 years, dependent on frequency of cycles.

2.14 Extraordinary effects

Fire

ASSA ABLOY DC500/DC700 are tested for usage in fire and smoke protection doors according to /EN1634-1/.

Water

Door closers include hydraulic oil and are designed for traditional locations and are not intended for flood protection. Unforeseeable flooding conditions will increase the potential for developing surface rust.

Mechanical destruction

No danger to the environment can be anticipated

during 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 weight, are aluminium alloy and steel, which can be recycled. The plastic components can be used for energy recovery in a waste incineration plant.

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 01/ copper, bronze, brass
/EWC 17 04 02/ aluminium
/EWC 17 04 05/ iron and steel.

2.17 Further information

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3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of door closer 500 / 700 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 door closer |
| Mass (total system) | 2.99 | kg/piece |
| Conversion factor to 1 kg | 0.33 | |

3.2 System boundary

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

Production phase:

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

Construction phase:

- A5 – Packaging waste processing

End-of-life phase:

- C2 – Transport to waste processing
- C4 – Disposal (landfill)

This includes provision of all materials, products and energy, packaging processing and its transport, as well as waste processing up to the end-of waste status or disposal of final residues.

- D - Declaration of all benefits or recycling potential from EOL and A5

3.3 Estimates and assumptions

Transport:

Real-world data, reported by suppliers, on the mode of transport and distance were used for components contributing more the 2% to the 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.

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 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 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 not within 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. In this EPD, the following specific life cycle inventories for the WIP are considered for:

- Waste incineration of plastic from packaging
- Waste incineration of paper from packaging

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, C1-C4 and D are given.

Installation into the building (A5)

| Name | Value | Unit |
|---|-------|------|
| Output substances following waste treatment on site Packaging (paper) | 0.3 | kg |

Reference service life

| Name | Value | Unit |
|------------------------|-------|------|
| Reference service life | 15 | a |

End-of-life (C1-C4)

| Name | Value | Unit |
|--|-------|------|
| Collected separately aluminium, brass, stainless steel, steel | 2.9 | kg |
| Collected as mixed construction waste construction waste for landfilling | 0.09 | kg |
| Recycling steel, stainless steel, | 2.6 | kg |

| | | |
|--------------------------------|------|----|
| aluminium | | |
| Landfilling construction waste | 0.09 | kg |

Re-use, recovery and/or recycling potentials (D), relevant scenario information

| Name | Value | Unit |
|---|-------|------|
| Collected separately waste type Door closer (including packaging) | 2.99 | kg |
| Recycling secondary aluminium | 43 | % |
| Recycling brass | 1 | % |
| Recycling steel | 43 | % |
| Reuse paper packaging (from A5) | 6 | % |
| Reuse plastic packaging (from A5) | 4 | % |
| Construction waste going to landfill | 3 | % |

5. LCA: Results

The Table below shows the LCA results for the declared unit - 1 piece of door closer DC 500 & DC 700.

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 | MND | MND | MND | MND | MND | MND | MND | X | MND | X | X | |

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

| Parameter | Unit | A1 - A3 | A5 | C2 | C4 | D |
|--|--|---------|----------|----------|----------|-----------|
| Global warming potential | [kg CO ₂ -Eq.] | 1.49E+1 | 2.58E-1 | 7.08E-2 | 3.05E-1 | -3.3E+0 |
| Depletion potential of the stratospheric ozone layer | [kg CFC11-Eq.] | 3.49E-9 | 7.06E-12 | 1.24E-12 | 4.99E-12 | -3.08E-10 |
| Acidification potential of land and water | [kg SO ₂ -Eq.] | 8.43E-2 | 6.65E-5 | 3.21E-4 | 7.81E-5 | -1.59E-2 |
| Eutrophication potential | [kg (PO ₄) ³⁻ -Eq.] | 6.58E-3 | 1.09E-5 | 7.41E-5 | 6.46E-6 | -1.1E-3 |
| Formation potential of tropospheric ozone photochemical oxidants | [kg Ethen Eq.] | 5.69E-3 | 6.72E-6 | -1.05E-4 | 5.45E-6 | -1.42E-3 |
| Abiotic depletion potential for non fossil resources | [kg Sb Eq.] | 1.01E-3 | 5.71E-9 | 2.64E-9 | 4.35E-8 | -1.93E-4 |
| Abiotic depletion potential for fossil resources | [MJ] | 1.67E+2 | 1.69E-1 | 9.79E-1 | 1.53E-1 | -3.46E+1 |

RESULTS OF THE LCA - RESOURCE USE: declared unit and product

| Parameter | Unit | A1 - A3 | A5 | C2 | C4 | D |
|--|-------------------|---------|---------|---------|---------|----------|
| Renewable primary energy as energy carrier | [MJ] | 5.77E+1 | - | - | - | - |
| Renewable primary energy resources as material utilization | [MJ] | 0.0E+0 | - | - | - | - |
| Total use of renewable primary energy resources | [MJ] | 5.77E+1 | 1.05E-2 | 3.85E-2 | 1.44E-2 | -7.45E+0 |
| Non renewable primary energy as energy carrier | [MJ] | 1.88E+2 | - | - | - | - |
| Non renewable primary energy as material utilization | [MJ] | 0.0E+0 | - | - | - | - |
| Total use of non renewable primary energy resources | [MJ] | 1.88E+2 | 1.87E-1 | 9.82E-1 | 1.72E-1 | -3.69E+1 |
| Use of secondary material | [kg] | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 | - |
| Use of renewable secondary fuels | [MJ] | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 |
| Use of non renewable secondary fuels | [MJ] | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 |
| Use of net fresh water | [m ³] | 1.31E+2 | 7.58E-1 | 4.27E-2 | 7.2E-1 | -1.87E+1 |

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: declared unit and product

| Parameter | Unit | A1 - A3 | A5 | C2 | C4 | D |
|-------------------------------|------|---------|---------|---------|---------|----------|
| Hazardous waste disposed | [kg] | 5.88E-3 | 3.31E-3 | 0.0E+0 | 3.04E-2 | -6.16E-4 |
| Non hazardous waste disposed | [kg] | 3.05E+0 | 2.62E-3 | 1.27E-4 | 5.92E-2 | -3.74E-1 |
| Radioactive waste disposed | [kg] | 8.67E-3 | 7.68E-6 | 1.37E-6 | 7.97E-6 | -9.32E-4 |
| Components for re-use | [kg] | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 | - |
| Materials for recycling | [kg] | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 | - |
| Materials for energy recovery | [kg] | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 | - |
| Exported electrical energy | [MJ] | 0.0E+0 | 8.92E-1 | 0.0E+0 | 0.0E+0 | - |
| Exported thermal energy | [MJ] | 0.0E+0 | 2.48E+0 | 0.0E+0 | 0.0E+0 | - |

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 as a percentage of total impact across all modules, with the exception of module D.

Production phase (module A1-A3) contributes between 96 and 100% to total impact assessment. This stage is dominated by upstream emissions associated with

steel- and secondary aluminium making processes. The environmental impacts for the transport (A2) have a negligible impact within this stage.

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

DIN EN 1154

EN 1154:1996/A1:2002/AC:2006 : Building hardware -
Controlled door closing devices - Requirements and
test methods

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)

CEN/TR 15894:2009

Building hardware - Door fittings for use by children,
elderly and disabled people in domestic and public
buildings - A guide for specifiers; German version
CEN/TR 15894:2009

ISO 9001:2008

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

DIN EN 1634-1:2012-07

Fire resistance and smoke control tests for door and
shutter assemblies, openable windows and elements
of building hardware - Part 1: Fire resistance test for
door and shutter assemblies and openable windows;
German version FprEN 1634-1:2012

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/](http://documentation.gabi-software.com/)

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



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