Algemene Brancheverenigging VHS

Milieuprestatieverklaring

Nederlandse bijlage

Deurdrangers

Behorend bij:

Owner of the Declaration	ARGE; European Federation of Associations of Lock and Builders Hardware Manufacturers
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ARG-20160183-IBG1-EN
ECO EPD Ref. No.	ECO-00000412
Issue date	14.09.2016
Valid to	13.09.2021

Door closers

ARGE; European Federation of Associations of Lock and Builders Hardware Manufacturers

Deze bijlage is alleen geldig in combinatie met de bijbehorende ARGE EPD en voor producten geleverd door een licentienemer van de Algemene Branchevereniging VHS

AXA

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Algemene Brancheverenigging VHS

Basis voor opname in de Nationale Milieudatabase (NMD)

LCA resultaten

Basisprofielen		Productie	Transport->bouw	Emissies	Onderhoud	Transport->afval	Afvalverwerking
Fase(n) EN 15804		A1 + A2 + A3 (+ A5)	A4	B1	B2	C2	C3 (+ C1, C4 en/of D)
Naam basisprofiel		VHS Deurdrangers inclusief deur coördinators	VHS Deurdrangers inclusief deur coördinators	VHS Deurdrangers inclusief deur coördinators	VHS Deurdrangers inclusief deur coördinators	VHS Deurdrangers inclusief deur coördinators	VHS Deurdrangers inclusief deur coördinators
Eenheid basisprofiel		kg	kg	kg	kg	kg	kg
Commentaar (optioneel)							
Ook opnemen in Processendatabase?		Nee	Nee	Nee	Nee	Nee	Nee
Abiotic depletion, non fuel	kg antimoon eq.	4,573E-04	1,948E-06	0,000E+00	0,000E+00	1,669E-08	2,515E-09
Abiotic depletion, fuel	kg antimoon eq.	3,517E-02	4,316E-03	0,000E+00	0,000E+00	3,699E-05	4,357E-05
Global warming (GWP100)	kg CO2 eq.	5,625E+00	5,889E-01	0,000E+00	0,000E+00	5,047E-03	7,971E-03
Ozone layer depletion (ODP)	kg CFK-11 eq.	4,718E-07	1,081E-07	0,000E+00	0,000E+00	9,262E-10	6,399E-10
Photochemical oxidation	kg ethyleen eq.	4,643E-03	2,678E-04	0,000E+00	0,000E+00	2,295E-06	1,684E-06
Acidification	kg SO2 eq.	3,796E-02	2,391E-03	0,000E+00	0,000E+00	2,049E-05	2,492E-05
Eutrophication	kg PO4- eq.	4,976E-03	4,062E-04	0,000E+00	0,000E+00	3,481E-06	4,217E-06
Human toxicity	kg 1,4-dichloorbenzeen eq.	1,078E+01	2,486E-01	0,000E+00	0,000E+00	2,131E-03	8,380E-04
Fresh water aquatic ecotox.	kg 1,4-dichloorbenzeen eq.	8,081E-02	7,939E-03	0,000E+00	0,000E+00	6,805E-05	8,852E-05
Marine aquatic ecotoxicity	kg 1,4-dichloorbenzeen eq.	3,326E+04	1,008E+02	0,000E+00	0,000E+00	8,642E-01	4,152E+00
Terrestrial ecotoxicity	kg 1,4-dichloorbenzeen eq.	6,556E-02	9,606E-04	0,000E+00	0,000E+00	8,233E-06	1,466E-05
Total renewable energy	MJ	17,40391258	0,112159765	0	0	0,000961369	0,0116035
Total non renewable energy	MJ	81,55846239	9,128021795	0	0	0,078240187	0,132440109
Total Energy	MJ	98,96237497	9,24018156	0	0	0,079201556	4,613392423
Water, fresh water use	m3	0,088999144	0,001721134	0	0	1,47526E-05	4,69441E-05
Waste, non hazardous	kg	4,426591599	0,468084807	0	0	0,004012155	0,004187226
Waste, hazardous	kg	1,335575192	0,00569704	0	0	4,88318E-05	0,00093354

Opmerkingen:

1. *Bij opname in de NMD is rekening gehouden met een levensduur van 30 jaar*
2. *Er is een conversiefactor van 2,36 toegepast (gewicht/stuk)*

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	ARGE; European Federation of Associations of Lock and Builders Hardware Manufacturers
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Door closers

ARGE; European Federation of Associations of Lock and Builders Hardware Manufacturers

(This EPD is valid only for products supplied by an ARGE EPD licence holder)

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1. General Information

ARGE

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

Declaration number
EPD-ARG-20160183-IBG1-EN

This Declaration is based on the Product Category Rules:
Building Hardware products, 02.2016
(PCR tested and approved by the SVR)

Issue date
14.09.2016

Valid to
13.09.2021

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

Dr. Burkhart Lehmann
(Managing Director IBU)

Door closers

Owner of the Declaration
ARGE; European Federation of Associations of Lock and Builders Hardware Manufacturers
Offerstraße 12, 42551 Velbert
Germany

Declared product / Declared unit
1 kg of door closer

Scope:
This Association EPD covers door closer devices designed to control the closing action of a door. The reference product used to calculate the impacts for this group of products is a door closer composed primarily of steel, aluminium and zamak, selected as the product having the highest impact by means of sustainability of the sample group. A validity scope analysis has been carried out to determine the limiting factors for door closers eligible to be covered by this industry representing EPD. The LCA assessment is based on a door closer device mainly made of steel, aluminium and zamak. In a preliminary study (simplified LCA), it turned out, that this EPD represents the worst case approach in order to cover all the door closers manufactured in Europe by ARGE's member companies. Among the product group, it is the one with the highest impact for 1 kg of product.
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 Norm /EN 15804/ serves as the core PCR
Independent verification of the declaration according to /ISO 14025/
☐ internally ☒ externally

Dr. Frank Werner
(Independent verifier appointed by SVR)

2. Product

2.1 Product description
This EPD refers to door closer and door coordinator mechanisms used to control the closing action of a door.

2.2 Application
These products are designed to be integrated into door assemblies of varying materials and applications. Their purpose is to control the closing action of the door. They may be used for either interior or exterior doors.

2.3 Technical Data
Normative reference: EN 1154- Controlled door closing devices and EN 1158 - Door coordinator devices

Door Closers including coordinating devices acc. to the classification in EN 1154 and EN 1158

Name	Value	Unit
Category of use	3, 4	Grade
Durability	5, 8	Grade
size	1 - 7	Grade
Fire resistance	0, 1	Grade
Safety	1	Grade
Corrosion resistance	0, 1, 2, 3, 4	Grade

2.4 Application rules
For the placing on the market in the EU/EFTA (with the exception of Switzerland) the Regulation (EU) No 305/2011 "Construction products regulation" has to be regarded.
In detail, the following harmonized product standards apply:

/EN 1154/ - Controlled door closing devices and /EN 1158/ - Door coordinator devices
In case that the products need to get CE-marked, a “declaration of performance” in accordance with this standard is obligatory.
For the application and use, respective additional national provisions may apply.

2.5 Delivery status
The products are sold by unit. Deliveries of a single unit might be possible but will be an exception. Regular deliveries will cover a larger amount of door closers as they are put on the market as "b to b" product and not for a final customer.

2.6 Base materials / Ancillary materials

Regarding the product analysed for this EPD:
The values are given for the product analysed for this EPD; ranges of the values for each material for the validity scope are given in brackets in this table.

Name	Value	Unit
Steel (50.20% – 75.29%)	75.29	%
Aluminium (18.99% – 49.00%)	19	%
Zamac (0.00% – 5.17%)	5.17	%
ABS (0.00% – 0.04%)	0.04	%
Brass (0.00% – 0.13%)	0.13	%
Nylon 66 (0.00% – 0.13%)	0.13	%
Polypropylene (0.00% – 0.08%)	0.08	%
Rubber (0.00% – 0.13%)	0.04	%
POM (0.00% – 0.04%)	0.04	%
PEHD (0.00% – 0.80%)	0.00	%

The product does not contain substances cited on the REACH list of hazardous substances.
Brass is an alloy of zinc and copper. Subcomponents made of brass are made by forging.
Bronze is an alloy of mainly copper and tin. Subcomponents made of bronze are made by wire drawing.
Iron is a metal produced in blast furnace. Subcomponents made of iron are made by sintering.
Steel is produced by combining iron with carbon as well as other elements depending on the desired characteristics. The subcomponents made of steel are mainly formed by stamping.

2.7 Manufacture
The production of a door closer regularly follows a 3 step procedure:
1. Prefabrication of the semi-finished products, this step might include a surface treatment on factory site or by external manufacturers.
2. Preassembly of assembly modules (onsite factory)
3. Final assembly (onsite factory)
The individual parts of the product are assembled manually.

2.8 Environment and health during manufacturing
Regular measurements of air quality and noise levels are performed by ARGE members manufacturers. The results are within the compulsory safety levels. In areas where employees are exposed to chemical products, prescribed safety clothes and technical safety devices are provided. Regular health checks are mandatory for employees of production sites.

2.9 Product processing/Installation
The installation of the product could vary depending on the type of door and the specific situation but products do not require energy consumption for installation.

2.10 Packaging
Normally each single product is packaged in paper. The products are then packed by batch in a cardboard box and stacked on wooden pallets for transport to the customer.
Wastes of product packaging are collected separately for waste valorisation including recycling.

2.11 Condition of use
Once installed, the products require no servicing during their expected service lives. There is no consumption of water or energy linked to their use, and they do not cause any emissions.

2.12 Environment and health during use
No environmental damage or health risks are expected within the normal conditions of use of the product.

2.13 Reference service life
The Reference Service Life for this product is 30 years. This is based on mechanical endurance test as specified in /EN 1154/ (/A1). The product is guaranteed to maintain its performance for at least 500 000 cycles of use.

2.14 Extraordinary effects

Fire
The product is suitable for use in fire resisting and/or smoke control door set according to 1 of the classes 0,1.

Water
The product is composed mainly of metal or plastic components and does not eluate hazardous ingredients in case of an unforeseen flooding

Mechanical destruction
In case of mechanical destruction of the declared product, it does not perform any impact on the environment or alter its substantial composition.

2.15 Re-use phase
Used components of a door closer are materials of high quality. After use stage, they can be recycled. In case of the disassembly of a door closer no impacts on the environment occur. As a rule, re-using the door closer as hardware device as a whole will not be an economical procedure.

2.16 Disposal
In case of the disassembly of a door the door closer might be removed and disposed separately Since this is a simple procedure the door closers might get recycled completely. The waste code in accordance with the /European Waste Code/ is 17 04 07.

2.17 Further information
Builders hardware door closers are manufactured in several different designs and construction types in general. Variations are subject to different types, sizes and requirements of the door/window. In general, the same product types might be suitable for wooden, steel or plastic based doors.

Details to be shown on the manufacturers' websites listed on http://arge.org/members/members-directory.htm

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit for door closers covered in this Association EPD is 1 kg. As single door closer units of the same production type can be custom made for an application situation and the weight of those variations of the same product type may be considerable, it is more appropriate to declare the weight of the product and the weight of the representative product rather than one item.
An evaluation of 4 samples of characteristic product individuals based on sales figures was taken for the LCA results described in section 5, the worst case product has been taken for the result of this EPD.

Declared unit

Name	Value	Unit
Declared unit mass	1	kg
Mass of declared product	2.36	kg

The EPD is valid only for EPDs with the range of the material composition as specified in section 2.6.

3.2 System boundary

The type of the EPD is "cradle-to-grave.
The analysis of the product life cycle includes the production and transport of the raw materials, manufacture of the product and the packaging materials, which are declared in modules A1-A3. Losses during production are considered as waste and are sent to recycling. No recycling processes are taken into account except transport and electricity consumption for grinding the metals. When recycled metals are used as raw material, only their transformation process is taken into account and not the extraction of the raw material.
A4 module represents the transport of the finished Door closers to the installation site.
There is no waste associated with the installation of the product. The A5 module therefore represents only the disposal of the product packaging.
For the RSL considered for this study, there are no inputs or outputs for the stages B1-B7.
The End-of-Life (EoL) stages are also considered. The transportation to the EoL disposal site is taken into account in module C2. Module C4 covers the disposal of the door closers. Module C3 covers the recycling of the individual elements according to European averages, with the remaining waste divided between incineration and landfill. The same assumption as for waste to recycling in A3 is used here.
For end-of-life modules (C1 to C4) the system boundaries from the XP P01-064/CN standard have been followed, see annex H.2 and H.6 of this document for figures and further details.
In practice, the end-of-life has been modeled as follows:
- When material is sent to recycling, generic transport and electric consumption of a shredder is taken into account (corresponding to the process "Grinding, metals"). Only then, the material is considered to have attained the "end-of-waste" state.
- Each type of waste is modeled as a transport to the treatment site with a distance of 30 km (source: FD P01-015). Parts sent to recycling include an electricity consumption (grinding) and a flow ("Materials for recycling, unspecified").
Four scenarios for the end of life of the products have been declared for this EPD:
- one with 100% of the product going to landfill
- one with 100% of the product going to incineration
- one with 100% of the product going to recycling
- one mixed scenario consisting of the previous three scenarios, values depending of the amount of waste going to recycling.
Module D has not been declared.

3.3 Estimates and assumptions

The LCA data of the declared door closer has been calculated by the production data of in total 2 member companies of the ARGE associations representing a total amount of 4 different products. These companies had been chosen by ARGE as being representative by means of their production processes and their market shares. The door closers chosen as representative for this calculation follow the "worst case" principle as explained under section 6 LCA interpretation.

3.4 Cut-off criteria

The cut -off criteria considered are 1% of renewable and non-renewable primary energy usage and 1% of the total mass of that unit process. The total neglected input flows per module shall be at a maximum of 5% of energy usage and mass.
For this study, all input and output flows have been considered at 100%, including raw materials as per the product composition provided by the manufacturer and packaging of raw materials as well as the final product. Energy and water consumption have also been considered at 100% according to the data provided. With the approach chosen, no significant environmental impacts are known to have been cut-off.

3.5 Background data

For life cycle modelling of the considered product, all relevant background datasets are taken from the ecoinvent 3.1 – Alloc Rec database. The life cycle analysis software used is SimaPro (V8.0.5), developed by PRé Consulting.

3.6 Data quality

The time factor, the life cycle inventory data used comes from:
Data collected specifically for this study on the ARGE manufacturers' sites. Data sets are based on 1- year averaged data (time period: January 2013 to December 2013).
In the absence of collected data, generic data from the ecoinvent V3 database was used. It is updated regularly and is representative of current processes (the entire database having been updated in 2014).

3.7 Period under review

The data of the LCA is based on the annual production data of several member companies of ARGE Associations from 2013.
Other values, e.g. for the processing of the base materials, are taken from the ecoinvent v3.1 Alloc Rec where the dataset age varies for each dataset, see ecoinvent documentation for more information.

3.8 Allocation

The products are produced in numerous production sites. All data were provided by the manufacturers of the products per unit and then divided by the mass of the product to give a value per kg of product produced. The assumptions relating to the EoL of the product are described in the section System Boundaries.
Metal losses during production (stage A3) are considered as waste.

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. The used background database has to be mentioned.

4. LCA: Scenarios and additional technical information

The following technical information is a basis for the declared modules or can be used for developing specific scenarios in the context of a building assessment if modules are not declared (MND).

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel	0.0045	l/100km
Transport distance	3500	km
Capacity utilisation (including empty runs)	36	%

Installation into the building (A5)

Name	Value	Unit
Material loss	0.344	kg

Reference service life

Name	Value	Unit
Reference service life (condition of use: see §2.13)	30	a

End of life (C1-C4)

Name	Value	Unit
Collected separately (All scenarii)	1	kg
Recycling (Mixed Scenario)	0.76	kg
Energy recovery (Mixed Scenario)	0.11	kg
Landfilling (Mixed Scenario)	0.13	kg
Incineration (100% incineration scenario) Scenario 1	1	kg
Landfilling (Landfill scenario) Scenario 2	1	kg
Recycling (100% recycling scenario) Scenario 3	1	kg

An assumption of a 16-32 tons truck transport of the product over 30 km between the dismantling site and the next treatment site is made (source: FD P01-015).

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

As Module D has not been declared, materials destined for recycling have been accounted for in the indicator “Materials for recycling” however, no benefit has been allocated.

5. LCA: Results

In Table 1 "Description of the system boundary", the declared modules are indicated with an "X"; all modules that are not declared within the EPD but where additional data are available are indicated with "MND". Those data can also be used for building assessment scenarios. The values are declared with three valid digits in exponential form.

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	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	MND

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 kg of door closer

Parameter	Unit	A1-A3	A4	A5	C1	C2	C2/1	C2/2	C2/3	C3	C3/1	C3/2	C3/3	C4	C4/1	C4/2	C4/3
GWP	[kg CO_2-Eq.]	5.61E+0	5.89E-1	1.26E-2	0.00E+0	5.05E-3	5.05E-3	5.05E-3	5.05E-3	4.21E-3	0.00E+0	0.00E+0	8.66E-3	2.85E-2	5.23E-1	4.97E-1	0.00E+0
ODP	[kg CFC11-Eq.]	4.71E-7	1.08E-7	3.47E-10	0.00E+0	9.26E-10	9.26E-10	9.26E-10	9.26E-10	4.52E-10	0.00E+0	0.00E+0	9.30E-10	2.08E-10	4.02E-9	3.43E-9	0.00E+0
AP	[kg SO_2-Eq.]	3.79E-2	2.39E-3	1.23E-5	0.00E+0	2.05E-5	2.05E-5	2.05E-5	2.05E-5	1.75E-5	0.00E+0	0.00E+0	3.60E-5	1.04E-5	2.58E-4	1.24E-4	0.00E+0
EP	[kg $(PO_4)^{3-}$-Eq.]	4.97E-3	4.06E-4	8.17E-6	0.00E+0	3.48E-6	3.48E-6	3.48E-6	3.48E-6	1.96E-6	0.00E+0	0.00E+0	4.04E-6	1.99E-5	7.52E-5	5.94E-4	0.00E+0
POCP	[kg ethene-Eq.]	4.64E-3	2.68E-4	3.79E-6	0.00E+0	2.30E-6	2.30E-6	2.30E-6	2.30E-6	9.63E-7	0.00E+0	0.00E+0	1.98E-6	4.67E-6	1.60E-5	1.41E-4	0.00E+0
ADPE	[kg Sb-Eq.]	4.57E-4	1.95E-6	3.89E-9	0.00E+0	1.67E-8	1.67E-8	1.67E-8	1.67E-8	1.71E-9	0.00E+0	0.00E+0	3.53E-9	1.96E-9	4.69E-8	2.47E-8	0.00E+0
ADPF	[MJ]	7.31E+1	8.97E+0	3.32E-2	0.00E+0	7.69E-2	7.69E-2	7.69E-2	7.69E-2	6.46E-2	0.00E+0	0.00E+0	1.33E-1	1.81E-2	3.73E-1	2.80E-1	0.00E+0

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: 1 kg of door closer

Parameter	Unit	A1-A3	A4	A5	C1	C2	C2/1	C2/2	C2/3	C3	C3/1	C3/2	C3/3	C4	C4/1	C4/2	C4/3
PERE	[MJ]	1.71E+1	1.12E-1	2.51E-3	0.00E+0	9.61E-4	9.61E-4	9.61E-4	9.61E-4	8.35E-3	0.00E+0	0.00E+0	1.72E-2	9.33E-4	1.14E-2	2.11E-2	0.00E+0
PERM	[MJ]	2.02E+0	0.00E+0	-1.74E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	1.91E+1	1.12E-1	-1.73E+0	0.00E+0	9.61E-4	9.61E-4	9.61E-4	9.61E-4	8.35E-3	0.00E+0	0.00E+0	1.72E-2	9.33E-4	1.14E-2	2.11E-2	0.00E+0
PENRE	[MJ]	8.13E+1	9.13E+0	4.17E-2	0.00E+0	7.82E-2	7.82E-2	7.82E-2	7.82E-2	9.47E-2	0.00E+0	0.00E+0	1.95E-1	2.07E-2	3.86E-1	3.53E-1	0.00E+0
PENRM	[MJ]	1.87E-1	0.00E+0	-9.83E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	[MJ]	8.15E+1	9.13E+0	3.18E-2	0.00E+0	7.82E-2	7.82E-2	7.82E-2	7.82E-2	9.47E-2	0.00E+0	0.00E+0	1.95E-1	2.07E-2	3.86E-1	3.53E-1	0.00E+0
SM	[kg]	7.86E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	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	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	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]	8.90E-2	1.72E-3	2.12E-5	0.00E+0	1.48E-5	1.48E-5	1.48E-5	1.48E-5	3.18E-5	0.00E+0	0.00E+0	6.54E-5	4.05E-5	1.17E-3	3.42E-4	0.00E+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: 1 kg of door closer

Parameter	Unit	A1-A3	A4	A5	C1	C2	C2/1	C2/2	C2/3	C3	C3/1	C3/2	C3/3	C4	C4/1	C4/2	C4/3
HWD	[kg]	1.34E+0	5.64E-3	2.19E-4	0.00E+0	4.83E-5	4.83E-5	4.83E-5	4.83E-5	2.98E-4	0.00E+0	0.00E+0	6.14E-4	6.89E-3	2.66E-1	1.24E-3	0.00E+0
NHWD	[kg]	4.41E+0	4.68E-1	1.33E-2	0.00E+0	4.01E-3	4.01E-3	4.01E-3	4.01E-3	1.35E-3	0.00E+0	0.00E+0	2.77E-3	3.08E-2	1.45E-2	1.00E+0	0.00E+0
RWD	[kg]	2.77E-4	6.13E-5	2.42E-7	0.00E+0	5.25E-7	5.25E-7	5.25E-7	5.25E-7	5.11E-7	0.00E+0	0.00E+0	1.05E-6	1.15E-7	1.35E-6	2.65E-6	0.00E+0
CRU	[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	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	7.05E-1	0.00E+0	1.33E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.86E-1	0.00E+0	0.00E+0	1.00E+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	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[MJ]	2.77E-4	0.00E+0	1.58E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.71E-3	1.39E+0	0.00E+0	0.00E+0
EET	[MJ]	5.68E-4	0.00E+0	3.30E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.56E-3	2.85E+0	0.00E+0	0.00E+0

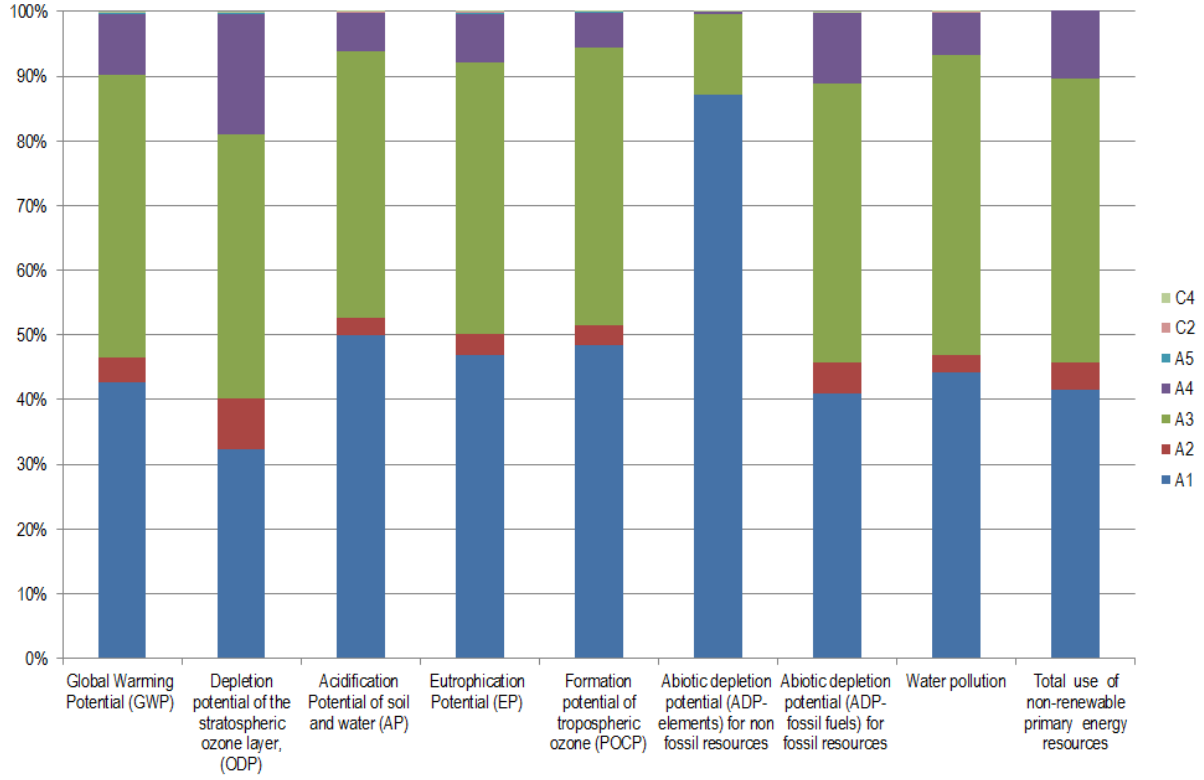
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

Other end of life scenarios have been calculated in order to build specific end of life scenario at the building level:

- scenario 1: the product is considered to be 100% incinerated
- scenario 2: the product is considered to be 100% landfilled
- scenario 3: the product is considered to be 100% recycled

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 stages (A1 and A3) are the main contributors to all environment indicators, especially for the ADP-elements indicator for A1 phase. Its impacts are mainly due to aluminium and steel extraction and production. A3 impacts come from aluminium and steel losses during the manufacturing of the product.
Transport stage A4 has a non-negligible impact for the ODP.
The results are conservative as complying with the composition given in section 2.6.



7. Requisite evidence

No testing results are required by the PCR part B.

8. References

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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@ibu-epd.com
Web **www.ibu-epd.com**

Programme holder
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@ibu-epd.com
Web **www.ibu-epd.com**

Author of the Life Cycle Assessment
CETIM
rue de la presse 7
42952 Saint-Etienne
France

Tel 0033477794042
Fax 0033477794099
Mail sqr@cetim.fr
Web **www.cetim.fr**

Owner of the Declaration
ARGE; European Federation of
Associations of Lock and Builders
Hardware Manufacturers
Offerstraße 12
42551 Velbert
Germany

Tel +49 (0)2051 9506 36
Fax +49 (0)2051 9506 25
Mail info@arge.org
Web **www.arge.org**