

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	Abloy
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ASA-20150155-IBA1-EN
Issue date	10.06.2015
Valid to	09.06.2020

Motor Lock – MP520 push & pull function multipoint motor lock case Abloy

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



1. General Information

Abloy Oy

Programme holder

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

Declaration number

EPD-ASA-20150155-IBA1-EN

This Declaration is based on the Product Category Rules:

IBU: PCR Locks and fittings, 07-2014
(PCR tested and approved by the independent expert committee (SVA))

Issue date

10.06.2015

Valid to

09.06.2020



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



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

MP520 push & pull function multipoint motor lock case for solid doors

Owner of the Declaration

Abloy Oy
Wahlforssinkatu 20,
80100 Joensuu
Finland

Declared product / Declared unit

The declaration represents 1 piece of MP520 push & pull function multipoint motor lock case for solid doors consisting of :

- Multipoint lock case
- Control unit
- Striker plates
- Cable
- Accessories

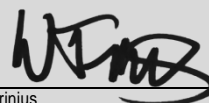
Scope:

The EPD is based on the full lifecycle of the MP520 push & pull function multipoint motor lock case for solid doors. Data collected from lock case manufacturing&assembly&packaging at 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.

Verification

The CEN Norm 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 SVA)

2. Product

2.1 Product description

Product name: The Motor lock, MP520 push & pull function multipoint lock case for solid doors.

Product characteristic:

- A pull outside, inside handle or handle and pull: door can be opened by pushing or pulling when the electrical control is on (e.g. timer, reader, push button). Inside handle opens the lock always.
- Multipoint lock consists from a main lock case in the middle which is based on single point motor lock and two auxiliary lock cases with hook bolts. The auxiliary locks are controlled by the main lock, so all the three separate locking points work simultaneously.

2.2 Application

MP520 motor lock is designed for:

- wooden or metal doors requiring multipoint locking (e.g. to reinforce the high door models structure)
- entrance doors, corridor doors
- high traffic exit doors and access controlled doors
- fire rated doors
- doors with door automatics

2.3 Technical Data

The table presents the technical properties of motor lock MP520:

Technical data

Name	Value	Unit
Dimensions (W*H*D)	202.4*15.6*2.4	cm
Weight	5,560	g
Supply voltage	12-24 12-18	VDC VAC
Power consumption (Idle)	0.96	W
Power consumption (Peak)	5.28	W
Temperature (Operating)	-25 - +70	°C
Temperature (Peak)	-25 - +70	°C

2.4 Placing on the market / Application rules

For the placing on the market of the products in the EU/EFTA (with the exception of Switzerland) the following harmonization legislation of the European Union applies:

- Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC (CPR),
- 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 (EMC directive)
- Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS directive).

The products are subject to CE marking according to this relevant harmonization legislation.

- a. CPR: Affixing the CE marking to the products means that, the products are in conformity with the declared performance as well as in compliance with all applicable requirements laid down in the CPR. The performance of the products is declared in accordance with the following harmonised standards:
 - CPR /EN 14846/ - Building hardware - Locks and latches - Electromechanically operated locks and striking plates.where relevant
 - CPR /EN 179/ - Building hardware - Locks and latches - Emergency exit devices operated by a lever handle or push pad, for use on escape routes.where relevant
 - CPR /EN 1125/ - Building hardware - Panic exit devices operated by a horizontal bar, for use on escape routes.where relevant
- b. EMC directive: Affixing the CE marking to the products means the compliance of apparatus with the EMC directive.
- c. RoHS directive: Affixing the CE marking to the products means the compliance of the products with the EMC directive.

For the application and use of the products the respective national provisions apply.

2.5 Delivery status

Delivered as set with control unit, striking plates and cable, or separately. Lock case and control unit are delivered in box size 2005mm x 155mm x 60mm, other parts separately.

2.6 Base materials / Ancillary materials

The composition of the motor lock MP520 in percentages (%) of total mass per unit is, as follows:

Material	Value (%)
Copper	0.04
Zinc	0.61
Steel	60.09
Stainless steel	20.50
Electronics	6.85
Electro mechanics	11.53
Plastics	0.31
Others	0.07
Total	100

2.7 Manufacture

Product is assembled and main steel parts manufactured at Abloy factories in Finland. Electronics and electro mechanics are provided by Tier-1 supplier in Finland, main stainless steel parts by Tier-1 supplier in Sweden and cable from Tier-1 supplier in India. The components come from processes like stamped steel, zinc and steel casting. Some of the components are surface treated with different coatings like zinc, while some are stainless steel.

2.8 Environment and health during manufacturing

Abloy Oy 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, GHG, energy, water, waste, VOC, surface treatment and H&S. Conduct periodic inspections, audits, and reviews to ensure that we meet applicable standards and to evaluate our environmental management program effectiveness.

Abloy Oy strictly follows the waste hierarchy:

- Prevention
- Minimization
- Reuse
- Recycle
- Energy recovery
- Disposal.

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/.

Employee safety is assured by implementing dust and ventilation extract systems for applicable processes.

2.9 Product processing/Installation

MP520 motor locks are distributed through, and installed by trained technicians, such as locksmiths or security technicians. Preparation of doors and frames are mainly conducted at the door manufacturer's production site.

2.10 Packaging

All packaging is fully recyclable. The packaging material is composed by cardboard and polyethylene film.

Material	Value (%)
Cardboard/paper	99.5
Plastics	0.5
Total	100

All materials incurred during installation are directed to a recycling unit.

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

EWC 15 01 01 paper and cardboard packaging
EWC 15 01 02 plastic packaging.

2.11 Condition of use

Annual maintenance of double action bolt and trigger bolt to maintain low friction and secure latching is grease, applied to contact surfaces. Lock 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 10 years is based on a typical installation of an MP520. Lock is tested 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 danger to the environment can be anticipated during mechanical destruction.

2.15 Re-use phase

The product is possible to re-use during the reference service life and be moved from one door to another. Waste codes according to European Waste Catalogue /EWC/ and Hazardous Waste List -Valid from 1 January 2002;

/EWC/ 16 02 13* discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12

/EWC/ 17 02 03 plastic

/EWC/ 17 04 01 copper, bronze, brass

/EWC/ 17 04 04 zinc

/EWC/ 17 04 05 iron and steel

/EWC/ 17 04 11 Cables with the exception of those outlined in 17 04 10 Disposal of the product is subject to the /WEEE/ Directive within Europe, Directive 2012/19/EU

2.16 Disposal

No disposal is foreseen for the product nor for the corresponding packaging.

2.17 Further information

Abloy Oy
Wahlforssinkatu 20,
80100 Joensuu, Finland

3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of Motor Lock MP520 as specified in Part B requirements on the EPD for Doors, windows, shutters, and related products /IBU PCR Part B/. (PCR tested and approved by the independent expert committee).

Declared unit

Name	Value	Unit
Declared unit	1	piece of motor lock
Mass (without packaging)	5.49	kg
Conversion factor to 1 kg	0.182	-

3.2 System boundary

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

A1-A3 Production stage:

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

A4-A5 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)

C1-C4 End-of-life stage:

- C2 – Transport to waste processing
- C3 – Waste processing
- C4 – Disposal (landfilling)

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

Module D:

- Declaration of all benefits or recycling potential from EoL and A5

3.3 Estimates and assumptions

Use phase:

For the use phase, it is assumed that the lock is used in European Union, thus an EU grid mix is considered within this stage.

EoL:

In the End-of-Life phase, for all the materials, which can be recycled, a recycling scenario with 100% collection rate was assumed.

3.4 Cut-off criteria

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

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

3.5 Background data

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

3.6 Data quality

The requirements for data quality and background data correspond to the specifications of the /IBU PCR Par 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 must have 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 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

Regarding the recycling material of metals, the metal parts in the EoL are declared as end-of-waste status. Thus, these materials are considered in module D.

Specific information on allocation within the background data is given in the GaBi dataset documentation.

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

4. LCA: Scenarios and additional technical information

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

Transport to the building site (A4)

Name	Value	Unit
Truck transport		
Litres of fuel diesel with maximum load (27 t payload)	39.4	l/100 km
Transport distance truck	1100	km
Capacity utilization (incl. empty runs) of truck	85	%
Ship transport		
Volume of heavy fuel oil with maximum load (27500 DWT)	5.3	m ³ /100 km
Transport distance ship	1250	km
Gross density of products transported	-	
Capacity utilization volume factor	-	

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site (Paper packaging)	1.08	kg
Output substances following waste treatment on site (Plastic packaging)	0.005	kg

Reference service life

Name	Value	Unit
Reference service life	10	a

Operational energy use (B6)

Name	Value	Unit
Electricity consumption	84.57	kWh
Days per year in use	365	d
Hours per day in on mode	0.03	h
Power consumption on mode	5.28	W
Hours per day in idle mode	23.97	h
Power consumption idle mode	0.96	W

End of life (C1-C4)

Name	Value	Unit
Collected separately Copper, zinc steel, stainless steel, electronics, electro mechanics, plastics,	5.49	kg
Collected as mixed construction waste	0.004	kg
Construction waste for landfilling	0.02	kg
Reuse Plastic parts	5.47	kg
Recycling Copper, zinc steel, stainless steel, electronics, electro mechanics	0.004	kg
Landfilling Construction waste for landfilling		

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

Name	Value	Unit
Collected separately waste type (including packaging)	6.58	kg
Recycling Copper	0.03	%
Recycling Zinc	0.51	%
Recycling Steel	50.17	%
Recycling Stainless steel	17.11	%
Recycling Electronics	5.72	%
Recycling Electro mechanics	9.63	%
Reuse Plastics	0.25	%
Reuse Paper packaging (from A5)	16.43	%
Reuse Plastic packaging (from A5)	0.08	%
Loss Construction waste for landfilling (no recycling potential)	0.06	%

5. LCA: Results

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

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

PRODUCT STAGE					CONSTRUCTION PROCESS STAGE	USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM 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	X	X	MND	MND	MND	MND	MND	X	MND	MND	X	X	X	X	

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece of Motor Lock MP520

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO ₂ -Eq.]	3.32E+01	4.37E-01	1.53E+00	4.02E+01	1.66E-01	1.23E-01	9.12E-01	-1.12E+01
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	9.90E-09	1.95E-12	7.00E-12	2.75E-08	7.71E-13	8.44E-11	1.64E-12	-4.33E-10
AP	Acidification potential of land and water	[kg SO ₂ -Eq.]	2.18E-01	4.86E-03	3.49E-04	1.89E-01	1.22E-03	5.81E-04	2.96E-04	-8.57E-02
EP	Eutrophication potential	[kg (PO ₄) ³⁻ -Eq.]	1.60E-02	6.81E-04	6.09E-05	1.07E-02	2.09E-04	3.28E-05	4.57E-05	-4.64E-03
POCP	Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	1.56E-02	-2.80E-04	2.48E-05	1.13E-02	-1.86E-04	3.46E-05	1.91E-05	-6.27E-03
ADPE	Abiotic depletion potential for non fossil resources	[kg Sb Eq.]	5.50E-03	1.51E-08	2.76E-08	5.56E-06	6.03E-09	1.71E-08	1.76E-07	-3.89E-03
ADPF	Abiotic depletion potential for fossil resources	[MJ]	4.28E+02	5.85E+00	4.29E-01	4.56E+02	2.26E+00	1.40E+00	5.28E-01	-1.16E+02

RESULTS OF THE LCA - RESOURCE USE: One piece of Motor Lock MP520

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	5.80E+01	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	5.80E+01	1.79E-01	4.00E-02	1.31E+02	8.08E-02	4.01E-01	6.11E-02	-4.53E+00
PENRE	Non renewable primary energy as energy carrier	[MJ]	4.71E+02	-	-	-	-	-	-	-
PENRM	Non renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PENRT	Total use of non renewable primary energy resources	[MJ]	4.71E+02	5.87E+00	5.03E-01	7.15E+02	2.27E+00	2.19E+00	6.13E-01	-1.18E+02
SM	Use of secondary material	[kg]	1.91E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	Use of renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	Use of non renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	Use of net fresh water	[m ³]	2.05E-01	1.33E-04	4.45E-03	3.22E-01	5.81E-05	9.90E-04	2.99E-03	-5.48E-02

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

One piece of Motor Lock MP520

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	2.05E-02	1.18E-05	3.46E-05	9.90E-02	4.91E-06	3.04E-04	8.84E-05	1.48E-03
NHWD	Non hazardous waste disposed	[kg]	2.96E+00	5.71E-04	3.85E-02	2.31E-01	2.58E-04	7.08E-04	1.86E-01	-9.88E-01
RWD	Radioactive waste disposed	[kg]	1.70E-02	7.58E-06	2.94E-05	1.03E-01	2.95E-06	3.16E-04	3.39E-05	-8.83E-04
CRU	Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
MFR	Materials for recycling	[kg]	0.00E+00	0.00E+00	1.08E+00	0.00E+00	0.00E+00	4.08E+00	0.00E+00	-
MER	Materials for energy recovery	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
EEE	Exported electrical energy	[MJ]	0.00E+00	0.00E+00	1.94E+00	0.00E+00	0.00E+00	0.00E+00	8.80E-02	-
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	5.46E+00	0.00E+00	0.00E+00	0.00E+00	2.41E-01	-

6. LCA: Interpretation

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

The production phase (modules A1-A3) contributes between 26% and 59% to the overall results for all the environmental impact assessment categories hereby considered, except for the abiotic depletion potential of elements (ADPE), for which the contribution from the production phase accounts for app. 100%. Stainless steel and steel accounts in total with app. 80% to the

overall mass of the product, therefore, the impacts are in line with the mass composition of the product. The environmental impacts for the transport (A2) have a negligible impact within this stage.

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

7. Requisite evidence

Not applicable in this EPD.

8. References

Institut Bauen und Umwelt

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

General principles

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

PCR Part A

Institut Bauen und Umwelt e.V., Berlin (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. April 2013
www.bau-umwelt.de

IBU PCR Part B

IBU PCR Part B: PCR Guidance-Texts for Building-Related Products and Services. From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU). Part B: Requirements on the EPD for Locks and fittings
www.bau-umwelt.com

EN 15804

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

GaBi 6 2013

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

ISO 14025

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

EMC Directive 2004/108/EC

Electro Magnetic Compatibility Directive

RoHS Directive 2011/65/EU

Restriction of the use of certain hazardous substances Directive

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

EN 179:2008

Building hardware - Emergency exit devices operated by a lever handle or push pad, for use on escape routes - Requirements and test methods

DIN EN ISO 14001

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

EWC

European Waste Catalog

WEEE

Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)

9. Annex

Results shown below were calculated using TRACI Methodology.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM 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	X	X	MND	MND	MND	MND	MND	X	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece of Motor Lock MP520

Parameter	Parameter	Unit	A1-3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO ₂ -Eq.]	3.32E+01	4.37E-01	1.53E+00	4.02E+01	1.66E-01	1.23E-01	9.12E-01	-1.12E+01
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	1.06E-08	2.07E-12	7.45E-12	2.92E-08	8.20E-13	8.98E-11	1.74E-12	-5.35E-10
AP	Acidification potential of land and water	[kg SO ₂ -Eq.]	2.14E-01	5.50E-03	4.23E-04	1.79E-01	1.46E-03	5.50E-04	3.63E-04	-8.13E-02
EP	Eutrophication potential	[kg N-eq.]	1.25E-02	2.54E-04	2.44E-05	7.63E-03	8.13E-05	2.34E-05	2.11E-05	-2.59E-03
Smog	Ground-level smog formation potential	[kg O ₃ -eq.]	2.59E+00	1.05E-01	9.87E-03	1.62E+00	2.87E-02	4.98E-03	7.16E-03	-8.30E-01
Resources		[MJ]	3.24E+01	8.42E-01	5.03E-02	3.25E+01	3.25E-01	9.97E-02	5.04E-02	-4.57E+00

RESULTS OF THE LCA - RESOURCE USE: One piece of Motor Lock MP520

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	5.80E+01	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	5.80E+01	1.79E-01	4.00E-02	1.31E+02	8.08E-02	4.01E-01	6.11E-02	-4.53E+00
PENRE	Non renewable primary energy as energy carrier	[MJ]	4.71E+02	-	-	-	-	-	-	-
PENRM	Non renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PENRT	Total use of non renewable primary energy resources	[MJ]	4.71E+02	5.87E+00	5.03E-01	7.15E+02	2.27E+00	2.19E+00	6.13E-01	-1.18E+02
SM	Use of secondary material	[kg]	1.91E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	Use of renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	Use of non renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	Use of net fresh water	[m ³]	2.05E-01	1.33E-04	4.45E-03	3.22E-01	5.81E-05	9.90E-04	2.99E-03	-5.48E-02

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

One piece of Motor Lock MP520

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	2.05E-02	1.18E-05	3.46E-05	9.90E-02	4.91E-06	3.04E-04	8.84E-05	1.48E-03
NHWD	Non hazardous waste disposed	[kg]	2.96E+00	5.71E-04	3.85E-02	2.31E-01	2.58E-04	7.08E-04	1.86E-01	-9.88E-01
RWD	Radioactive waste disposed	[kg]	1.70E-02	7.58E-06	2.94E-05	1.03E-01	2.95E-06	3.16E-04	3.39E-05	-8.83E-04
CRU	Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
MFR	Materials for recycling	[kg]	0.00E+00	0.00E+00	1.08E+00	0.00E+00	0.00E+00	4.08E+00	0.00E+00	-
MER	Materials for energy recovery	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
EEE	Exported electrical energy	[MJ]	0.00E+00	0.00E+00	1.94E+00	0.00E+00	0.00E+00	0.00E+00	8.80E-02	-
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	5.46E+00	0.00E+00	0.00E+00	0.00E+00	2.41E-01	-

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