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
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
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Valid to	04.09.2022

Locks

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	Locks
Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the Declaration** ARGE; European Federation of Associations of Lock and Builders Hardware Manufacturers Offerstraße 12, 42551 Velbert Germany
Declaration number EPD-ARG-20160154-IBG1-EN	**Declared product / Declared unit** 1 kg locks
This Declaration is based on the Product Category Rules: Building Hardware products, 02.2016 (PCR tested and approved by the SVR) **Issue date** 05.09.2016 **Valid to** 04.09.2022	**Scope:** This ARGE EPD covers locks used to secure doors, windows or shutters in buildings. The reference product used to calculate the impact this product group has on the environment is a high security night latch composed primarily of steel zinc-based alloy and brass, and has been selected for the LCA (Life Cycle Assessment) because it is the product with the highest impact for 1 kg of product. A validity scope analysis has also been carried out to determine the limiting factors for locks covered by this EPD. In a preliminary study (simplified LCA), it has been confirmed that this EPD represents the worst case condition and it can therefore be used to cover all locks manufactured in Europe by ARGE member companies. The owner of the declaration shall be liable for the underlying information and evidence, but the ARGE programme holder (IBU) cannot be held responsible for manufacturer's information, life cycle assessment data or evidence

Verification

The CEN Norm /EN 15804/ serves as the core PCR

Independent verification of the declaration according to /ISO 14025/

☐ internally ☒ externally

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

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(Managing Director IBU)

Dr. Frank Werner
(Independent verifier appointed by SVR)

2. Product

2.1 Product description

This EPD refers to mechanical locks, latches and security devices to be used in buildings. The sample group used to calculate the LCA data for this ARGE EPD includes sash locks, multipoint locks and night latches.

2.2 Application

These products are designed to be used in door assemblies of varying materials and applications. Their purpose is to ensure the fastening of doors, windows or shutters in the closed position. They can be used on either interior or exterior doors.

2.3 Technical Data

Ideally, products should comply with a suitable technical specification. /EN 12209/ is an example of such a specification and some products will comply with this. The relevant grading structure is shown in the following table

Locks according to the classification in EN 12209

Name	Value	Unit
Required technical characteristic	-	
Category of use	1 - 3	Grade
Durability	A,B,C,L,M,R,S,W,X	Grade
door mass and closing force	0 - 9	Grade
Suitability for use in fire resisting and/or smoke control door sets	0,A,B,N	Grade
Safety	0	Grade
Corrosion resistance	0,A,C,D,F,G	Grade
Security - burglar resistance	0 - 7	Grade
Key identification of lever locks	0,A,B,C,D,E,F,G,H	Grade

The quoted standard defines the requirements of the product and the associated test methods. As construction hardware products are part of a set of a construction components (doorset, shutter, window), European application standards for locks themselves do not exist.

2.4 Application rules

For construction products placed on the market EU Regulation No 305/2011 "Construction products regulation" might apply. If requested relating to their use, locks shall be CE marked to harmonized product standard /EN 12209/ - Building hardware – Locks and latches – Mechanically operated locks, latches and locking plates – and shall have a Declaration of Performance

For application and use, additional national provisions may also 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 locks as they are put on the market as "B2B" product and not for a single customer.

2.6 Base materials / Ancillary materials

Composition of product analysed for this EPD:
The values given are for the product analysed for this EPD. Ranges of values for other products covered by the validity scope analysis are shown in brackets

Name	Value	Unit
Zinc-based alloy (0% - 63,73%)	64	%
Steel (20,96% - 91,25%)	21	%
Brass (3,31% - 9,21%)	9	%
Nickel Silver (0% - 5,49%)	6	%
Bronze (0% - 0,44%)	0	%

Nylon 66 and Acetal as ancillary material.
The product contains no substances cited on the REACH list of hazardous substances.
Zinc-based alloy is an alloy of four separate metals: zinc, aluminium, magnesium and copper. Zinc-based alloy lock components are made by pressure diecasting
Steel is produced by combining iron with carbon as well as other elements depending on the desired characteristics. Steel lock components are made by pressing and/or cold forming.
Brass is an alloy of zinc and copper. Brass lock components are made by pressing and/or cold forming or hot stamping.
Nickel silver is an alloy of copper (~60%) with nickel (~20%) and zinc (~20%). Nickel silver key blanks are formed by pressing.
Nylon 66 is a polyamide produced by the polycondensation of hexamethylenediamine and adipic acid in equal parts. This can then be combined with glass fibres to improve its mechanical properties. Subcomponents made of nylon are formed by injection moulding.
Acetal, or polyoxymethylene, is produced via polymerisation of anhydrous formaldehyde. Subcomponents made of acetal are formed also by injection moulding.

2.7 Manufacture

The production of a lock normally follows a 3 step procedure:
1. Preparation of semifinished components ((as indicated in 2.6) 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)

2.8 Environment and health during manufacturing

Regular measurements of air quality and noise levels are performed by ARGE member manufacturers. Resulting levels shall be within compulsory safety limits. In areas where employees are exposed to chemical products, prescribed safety clothes and technical safety devices shall be 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 shall not require energy consumption for installation.

2.10 Packaging

Normally each single product is packaged in paper. Bigger amounts of 12 to 50 locks are then packed in a paperboard box and then stacked on wooden pallets for transport to the customer (Door or window manufacturer). Waste from product packaging is collected separately for waste disposal (including recycling).

2.11 Condition of use

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

2.12 Environment and health during use

No environmental damage or health risks are to be expected during normal conditions of use.

2.13 Reference service life

The Reference Service Life is 30 years under normal working conditions. This corresponds to passing a mechanical endurance test of 100.000 cycles as specified in the /EN 12209/. The Reference Service Life is dependent on the actual frequency of use and environmental conditions. It is required that installation, as well as maintenance of the product, must be done in line with instructions provided by the manufacturer.

2.14 Extraordinary effects

Fire
The product is suitable for use on fire resisting and/or smoke control doorsets according to one of the classes 0,A,B,N. in /EN 12209:2016/

Water
The declared product is intended to be used in a building under normal conditions (indoor and outdoor use). It shall not emit hazardous substances in the event of flooding.

Mechanical destruction
Mechanical destruction of the declared product shall not materially alter its composition or have any adverse effect on the environment.

2.15 Re-use phase
Removal of locks (for re-use or re-cycling) shall have no adverse effect on the environment.

2.16 Disposal
Locks should be re-cycled wherever possible, providing that there is no adverse effect on the environment. The waste code in accordance with the /European Waste Code/ is 17 04 07.

2.17 Further information
Details of all types and variants 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 all products covered by ARGE EPD is 1 kg (of product). Since individual products will rarely weigh exactly 1 kg it is necessary to establish the exact weight of the product then use this as a correction factor to determine the true values for 1 kg of product in the tables (Section 5).

A total of 9 typical products (based on sales figures) have been evaluated, and the worst case results are used in the tables.

Correction factor

Name	Value	Unit
Declared unit mass	1	kg
Mass of declared Product	1.64	Kg
Correction factor	Divide by 1.64	

3.2 System boundary
The type of the EPD covers “cradle to grave” requirements.
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 for recycling. No recycling processes are taken into account except transport and an 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 Locks 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.
Re-cycling requirement considered for this study, have no inputs or outputs in 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 locks. 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 modelled as follows:
- When a material is sent for recycling, generic transport and electric consumption of a shredder is taken into account (corresponding to the process “Grinding, metals”). Only then, is the material considered to have attained the “end of waste” state.
- Each type of waste is modelled as a transport to the treatment site with a distance of 30 km (source: FD P01-015). Parts sent for 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:
1. 100% of the product going in landfill
2. 100% of the product going in incineration
3. 100% of the product going in recycling
4. Mixed scenario consisting of the previous three scenarios, values depend on the amount of waste going to recycling.

Module D has not been declared.

3.3 Estimates and assumptions
The LCA data of the declared lock has been calculated using the production data of 9 ARGE member companies. These companies have been chosen by ARGE as being representative by virtue of their production processes and their market shares. The lock chosen as representative for this calculation follows the "worst case" principle as explained under 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 amount to 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 consumptions 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 /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 objective of this evaluation is to evaluate the environmental impacts generated by the products throughout their entire life cycles. To this end, ISO 14040, ISO 14044 and EN 15804 have been met regarding the quality of data on the following different criteria:
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/. This is updated regularly and is representative of current processes (the entire database having been updated in 2014).
Geography:
Data comes from production sites of the ARGE manufacturers.
The generic data comes from the ecoinvent database, representative of the European processes.
Technology - material shaping technologies are based on:
European technology in the case of use of generic data.

3.7 Period under review

The data of the LCA is based on the annual production data of an ARGE member from 2013. Other values , e.g. for the processing of the base materials, are taken from the ecoinvent v3.1 Alloc Rec where 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 was 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 and waste during its life cycle 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 are created according to /EN 15804/ and the building context, and the product-specific characteristics of performance, are taken into account.

4. LCA: Scenarios and additional technical information

The following information is the basis of the declared modules within the LCA in this EPD. Additional information which has not been used for Modules Not Declared (MND) can nevertheless be used for further calculations like developing specific scenarios in the context of a building assessment.

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel	45	l/100km
Transport distance	350	km
Capacity utilisation (including empty runs)	36	%

Installation into the building (A5)

Name	Value	Unit
Material loss	0	kg
Output substances following waste treatment on site	0.135	kg

Repair (B3)
No repairs are required during the RSL.

Replacement (B4) / Refurbishment (B5)
No replacement is required during the RSL.

Operational energy use (B6) and Operational water use (B7)
No operational energy and water are needed during the RSL.

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 (Mixed scenario)	1	kg
Recycling (Mixed scenario)	0.281	kg
Energy recovery (Mixed scenario)	0.331	kg
Landfilling (Mixed scenario)	0.388	kg
Incineration (100% incineration scenario) Scenario 1	1	kg
Landfilling (Landfill scenario)	1	kg
Scenario 2		
Recycling (100% recycling scenario) Scenario 3	1	kg

It is assumed that a 16-32 ton truck is used to transport the product over the (up to?) 30 km distance between the dismantling site and the next treatment site (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.

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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 is available are indicated with "MND". This 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 / locks

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.]	5.40E+0	5.89E-1	6.01E-3	0.00E+0	5.05E-3	5.05E-3	5.05E-3	5.05E-3	3.95E-3	0.00E+0	0.00E+0	8.66E-3	3.10E-2	5.23E-1	4.97E-1	0.00E+0
ODP	[kg CFC11-Eq.]	3.47E-7	1.08E-7	3.40E-10	0.00E+0	9.26E-10	9.26E-10	9.26E-10	9.26E-10	4.24E-10	0.00E+0	0.00E+0	9.30E-10	2.26E-10	4.02E-9	3.43E-9	0.00E+0
AP	[kg SO_2-Eq.]	1.19E-1	2.39E-3	1.69E-5	0.00E+0	2.05E-5	2.05E-5	2.05E-5	2.05E-5	1.64E-5	0.00E+0	0.00E+0	3.60E-5	1.13E-5	2.58E-4	1.24E-4	0.00E+0
EP	[kg $(PO_4)^{3-}$-Eq.]	1.72E-2	4.06E-4	5.19E-6	0.00E+0	3.48E-6	3.48E-6	3.48E-6	3.48E-6	1.84E-6	0.00E+0	0.00E+0	4.04E-6	2.17E-5	7.52E-5	5.94E-4	0.00E+0
POCP	[kg ethene-Eq.]	6.26E-3	2.68E-4	3.27E-6	0.00E+0	2.30E-6	2.30E-6	2.30E-6	2.30E-6	9.05E-7	0.00E+0	0.00E+0	1.98E-6	5.08E-6	1.60E-5	1.41E-4	0.00E+0
ADPE	[kg Sb-Eq.]	5.55E-3	1.95E-6	4.09E-9	0.00E+0	1.67E-8	1.67E-8	1.67E-8	1.67E-8	1.61E-9	0.00E+0	0.00E+0	3.53E-9	2.13E-9	4.69E-8	2.47E-8	0.00E+0
ADPF	[MJ]	7.25E+1	8.97E+0	3.34E-2	0.00E+0	7.69E-2	7.69E-2	7.69E-2	7.69E-2	6.06E-2	0.00E+0	0.00E+0	1.33E-1	1.97E-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 / locks

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]	8.96E+0	1.12E-1	1.43E-3	0.00E+0	9.61E-4	9.61E-4	9.61E-4	9.61E-4	7.84E-3	0.00E+0	0.00E+0	1.72E-2	1.01E-3	1.14E-2	2.11E-2	0.00E+0
PERM	[MJ]	2.49E+0	0.00E+0	-7.20E-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
PERT	[MJ]	1.15E+1	1.12E-1	-7.19E-1	0.00E+0	9.61E-4	9.61E-4	9.61E-4	9.61E-4	7.84E-3	0.00E+0	0.00E+0	1.72E-2	1.01E-3	1.14E-2	2.11E-2	0.00E+0
PENRE	[MJ]	7.58E+1	9.13E+0	3.72E-2	0.00E+0	7.82E-2	7.82E-2	7.82E-2	7.82E-2	8.89E-2	0.00E+0	0.00E+0	1.95E-1	2.25E-2	3.86E-1	3.53E-1	0.00E+0
PENRM	[MJ]	2.06E-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
PENRT	[MJ]	7.60E+1	9.13E+0	3.72E-2	0.00E+0	7.82E-2	7.82E-2	7.82E-2	7.82E-2	8.89E-2	0.00E+0	0.00E+0	1.95E-1	2.25E-2	3.86E-1	3.53E-1	0.00E+0
SM	[kg]	1.59E-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	[m³]	7.48E-2	1.72E-3	3.64E-5	0.00E+0	1.48E-5	1.48E-5	1.48E-5	1.48E-5	2.98E-5	0.00E+0	0.00E+0	6.54E-5	4.40E-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 / locks

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]	9.08E-1	5.64E-3	3.64E-4	0.00E+0	4.83E-5	4.83E-5	4.83E-5	4.83E-5	2.80E-4	0.00E+0	0.00E+0	6.14E-4	7.49E-3	2.66E-1	1.24E-3	0.00E+0
NHWD	[kg]	7.47E+0	4.68E-1	4.58E-2	0.00E+0	4.01E-3	4.01E-3	4.01E-3	4.01E-3	1.26E-3	0.00E+0	0.00E+0	2.77E-3	3.35E-2	1.45E-2	1.00E+0	0.00E+0
RWD	[kg]	1.61E-4	6.13E-5	2.06E-7	0.00E+0	5.25E-7	5.25E-7	5.25E-7	5.25E-7	4.80E-7	0.00E+0	0.00E+0	1.05E-6	1.25E-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]	1.11E-1	0.00E+0	5.28E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.56E-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]	1.36E-3	0.00E+0	4.96E-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	3.90E-2	1.39E+0	0.00E+0	0.00E+0
EET	[MJ]	2.75E-3	0.00E+0	1.05E-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	7.99E-2	2.85E+0	0.00E+0	0.00E+0

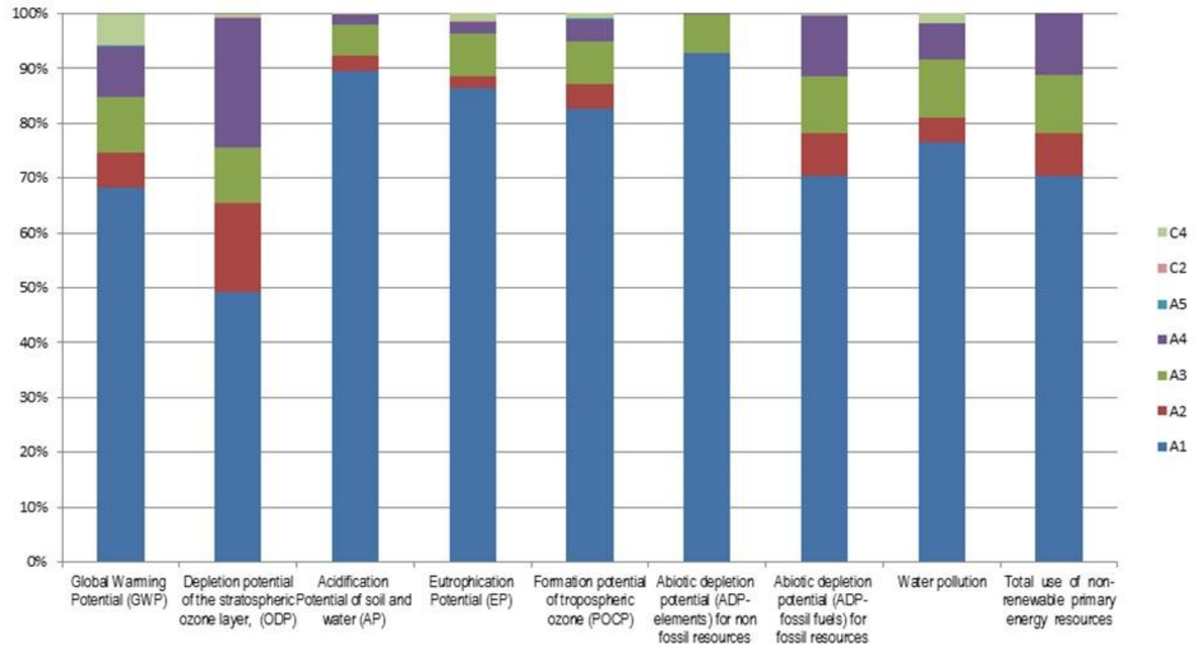
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

Other end of life scenarios have been calculated in order to build specific end of life scenarios 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. The table below represents the distribution of the impacts throughout the life cycle (module D excluded and steps with 0 impacts not shown).
Raw material extraction phase (A1) contributes to the majority of the impacts where Zamak is the main contributor. The transport stages (A2 and A4) have a non-negligible impact on the indicator **ODP** (Depletion potential of the stratospheric ozone layer). Other life cycle phases have no major impact on all indicators.

The results are conservative as complying with the composition given in clause 2.6.



7. Required evidence

No testing results are required by the PCR part B.

8. References

ISO 14040
ISO 14040:2006-10, Environmental management – Life cycle assessment – Principles and framework (ISO 14040:2006).” German and English version EN ISO 14040:2006.

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Ecoinvent 3.1
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EN 15804:2012-04+A1 2013: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

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