

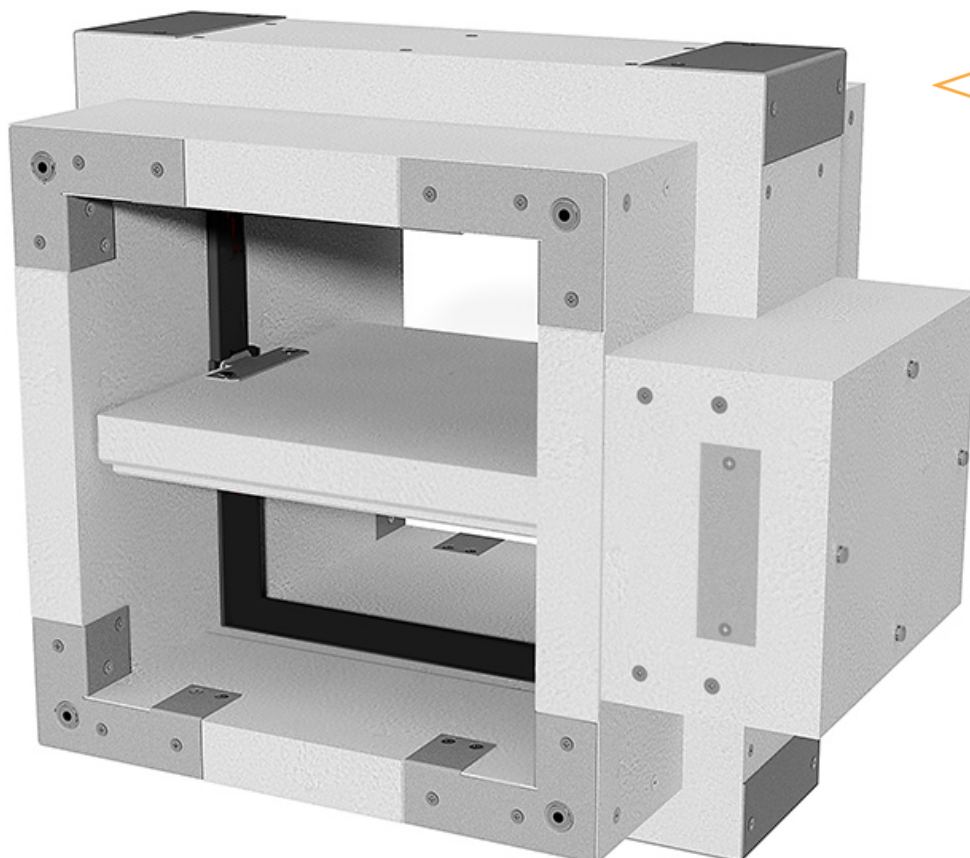
ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804



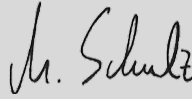
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Valid to	5/18/2021

EK90 smoke control damper (EK92 series)
Wildeboer Bauteile GmbH

www.ibu-epd.com / <https://epd-online.com>



1. General Information

<p>Wildeboer Bauteile GmbH</p> <hr/> <p>Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany</p> <hr/> <p>Declaration number EPD-WIL-20160047-ICC1-EN</p> <hr/> <p>This Declaration is based on the Product Category Rules: Fire dampers and fire protection valves and smoke control damper, 05.2015 (PCR tested and approved by the SVR)</p> <hr/> <p>Issue date 5/19/2016</p> <hr/> <p>Valid to 5/18/2021</p> <hr/> <p style="text-align: center;"></p> <hr/> <p>Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)</p> <hr/> <p style="text-align: center;"></p> <hr/> <p>Dr. Burkhardt Lehmann (Managing Director IBU)</p>	<p>EK90 smoke control damper (EK92 series)</p> <hr/> <p>Owner of the Declaration Wildeboer Bauteile GmbH Marker Weg 11 DE - 26826 Weener</p> <hr/> <p>Declared product / Declared unit 1 smoke control damper with electric actuator</p> <hr/> <p>Scope: This document refers to the manufacture, transport, installation, operation and disposal of smoke control dampers with electric actuators in systems for smoke extraction, smoke protection, for air supply and in combined systems for the ventilation of buildings. The smoke Control dampers are produced exclusively at the Weener plant in Germany where production data for 2014 was recorded. This document is translated from the German Environmental Product Declaration into English. It is based on the German original version EPD-WIL-20160047-ICC1-DE. The verifier has no influence on the quality of the translation. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.</p> <hr/> <p>Verification</p> <table border="1" style="width: 100%;"> <tr> <td colspan="2">The CEN Norm /EN 15804/ serves as the core PCR</td> </tr> <tr> <td colspan="2" style="text-align: center;">Independent verification of the declaration according to /ISO 14025/</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/> internally</td> <td style="text-align: center;"><input checked="" type="checkbox"/> externally</td> </tr> </table> <hr/> <p style="text-align: center;"></p> <hr/> <p>Matthias Schulz (Independent verifier appointed by SVR)</p>	The CEN Norm /EN 15804/ serves as the core PCR		Independent verification of the declaration according to /ISO 14025/		<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally
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2. Product

2.1 Product description

The maintenance-free corrosion-resistant EK90 smoke control damper (EK92 series) comprises a casing made of high-temperature resistant, abrasion-resistant calcium silicate with an interior unbreakable damper blade. The smoke control damper features edge protection profiles made of galvanised sheet steel and connecting bore holes. Drive axles are made of stainless steel. Protective grilles, as optional accessories for smoke control dampers without connecting ducts for protecting the flow-through openings, are made of galvanised sheet steel. The operator for opening and closing the smoke control damper is an electric actuator. Special gaskets without additional stops permit large and free cross-sections, extremely low pressure drops and sound power level. The smoke control damper can still be opened even after 25 minutes of full exposure to fire.

2.2 Application

The EK90 smoke control damper (EK92 series) is suitable for smoke protection, smoke extraction systems, air supply and in combined systems for the

ventilation of buildings. It can also be used in systems whose smoke control dampers are opened or closed automatically or manually. The “fully open”, “fully closed” and any intermediate positions have been verified and approved. The smoke control damper can be used for installation in rigid walls and ceilings ≥ 100 mm thick, in metal stud walls ≥ 95 mm thick, on and in horizontal or vertical smoke extraction ducts. Smoke extraction ducts with fire-resistance period can be connected on one or both sides of the smoke control damper; the smoke extraction ducts without fire-resistance period can only be connected on one side; the protective grilles can be connected on one or both sides. The installation is wet or dry on site. For more information, please refer to the /manufacturer’s documents/.

2.3 Technical Data

The following section includes details on sizes and performance in levels and classes in relation to the essential characteristics of the EN 12101-8. The full declared product performance in terms of all essential characteristics in accordance with EN 12101-8 is

provided in the /Declaration of Performance/ issued by *Wildeboer Bauteile GmbH*. Fire tests were performed in accordance with /DIN EN 1366-10/ and /DIN EN 1366-2/.

Technical construction data

Name	Value	Unit
Width	200 - 1500	mm
Height	200 - 800	mm
Length	350 - 850	mm
Tightness class in accordance with /DIN EN 1751/	C	-
Smoke control damper classification in accordance with /DIN EN 13501-4/	EI 90 (vedw - hodw, i<->o) S 1500 Cmod HOT400/30 MA multi	-

2.4 Application rules

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 applies for placing the product on the market in the EU/EFTA. A Declaration of Performance is required for the product taking consideration of the harmonised product standard /DIN EN 12101-8/ "Smoke and heat control systems - Part 8: Smoke control dampers", CE-marking in accordance with Regulation (EU) No. 305/2011 and the /manufacturer's documents/ of the product issued by *Wildeboer Bauteile GmbH*, including the installation and assembly instructions. Use is governed by the respective national regulations.

2.5 Delivery status

Available in size variants (W x H) 200 x 200 mm to 1500 x 800 mm, lengths 350 to 850 mm. Plus the electric actuator and the protective grilles and accessory kits as optional accessories for assembly, e.g. shear protection brackets, terminal strip etc.

2.6 Base materials / Ancillary materials

All details are weight percentages. These are approximate details.

EK90 (without electric actuator, incl. standard accessory kit)

Steel, galvanised: 6% to 22%

Stainless steel: 0.2% to 1%

Brass: 0.2 % to 1%

Calcium silicate: 72% to 93%

Plastic: < 0.1%

Other (intumescent sealing, adhesive etc.): 1% to 3%

Electric actuator for H ≤ 450 mm

Steel: 73%

Brass: 0.2%

Plastic: 11%

Electronic components (circuit board and cables): 16%

Electric actuator for H > 450 mm

Steel: 83.5%

Brass: 0.1%

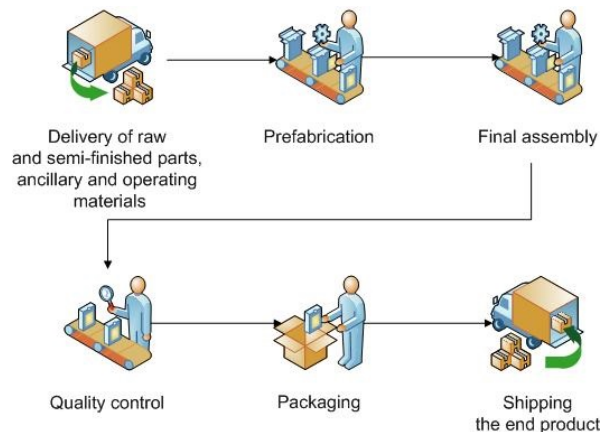
Plastic: 4%

Electronic components (circuit board and cables): 12.5%

2.7 Manufacture

Production is at one location in the Weener plant. The necessary raw and semi-finished parts, ancillary materials and operating materials are delivered by suppliers and are incorporated in production. Semi-finished parts are manufactured in a prefabrication process using standard manufacturing methods. Metal parts are punched and edged to shape, possibly milled; calcium silicate parts are sawn and milled. Blanks are optimised accordingly in order to avoid waste. Any waste incurred is collected and where possible recycled by the corresponding companies, or disposed of and incinerated as domestic waste. Lubricants are largely collected, treated and re-used in production. Dust and fumes are extracted and collected on site.

Prefabricated parts are assembled along with bought-in parts to smoke dampers, inspected within the framework of quality assurance to /DIN EN ISO 9001/, packed and shipped.



2.8 Environment and health during manufacturing

During the entire manufacturing process, no measures extending over and beyond statutory industrial safety are required. Waste is largely avoided by means of optimised blanks and lubricants are re-used via recycling measures.

2.9 Product processing/Installation

The manuals, installation guidelines, operating instructions and Declarations of Performance issued by *Wildeboer Bauteile GmbH* must be observed. Furthermore, the safety and processing specifications concerning drywall construction, masonry or electrical work, for example, must be followed as well as the statutory guidelines for industrial occupational safety.

2.10 Packaging

The products are packed on reusable pallets using supporting and securing elements made of corrugated board and wrapped in PE foil. With the exception of pallets, disposal is handled by local recycling companies. Pallets are re-used on an exchange basis. Only as much packaging material is used as required and is subject to optimised packing.

2.11 Condition of use

Material composition does not alter during use. This excludes extremely unusually effects which can cause changes. Smoke control dampers are maintenance-free. Please refer to the /manufacturer's documents/

for regular functional inspections of smoke control dampers.

2.12 Environment and health during use

No negative impacts on the environment and health are to be anticipated during use. The maintenance-free, encapsulated electric actuators are lubricated for the duration of their service lives and are not positioned within an air flow. Because of the design, no deposits of soiling are incurred.

2.13 Reference service life

When used as designated, an average service life of approx. 20 years can be anticipated for EK90 smoke control dampers (EK92 series).

2.14 Extraordinary effects

Fire

In accordance with the specifications in the /List of Technical Building Rules/ by Deutsches Institut für Bautechnik (DIBt; Engl.: Centre of Competence for Construction) in Berlin, "Smoke control dampers must essentially comprise non-combustible building materials". Please refer to the table for minimum classes.

Fire protection

Name	Value
Building material class	A2
Burning dripping	s1

Smoke gas development	d0
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Water

When exposed to extreme volumes of water, the materials may partially be wet through. Smoke control dampers must then be repaired or replaced. Large volumes of water do not generally arise in ventilation and air-conditioning systems. On building sites, the smoke control dampers are protected by their packaging.

Mechanical destruction

Not of relevance.

2.15 Re-use phase

In line with the composition of smoke control dampers, the metal and electronic components can be recycled. The remaining components (e.g. calcium silicate) can be disposed of as building rubble.

2.16 Disposal

Disposal can be classified in accordance with the KPIs of the Ordinance on the European list of wastes /AVV/: steel (17 04 05), concrete (17 01 01) / mixtures of concrete (17 01 07), plastic (17 02 03), electrical components (20 01 36).

2.17 Further information

www.wildeboer.de

3. LCA: Calculation rules

3.1 Declared Unit

The Declaration refers to one EK90 smoke control damper (EK92 series) manufactured by *Wildeboer Bauteile GmbH* measuring 200 mm x 200 mm x 350 mm (unit weight of 32.07 kg) including electric actuator (weighing 1.37 kg) and standard accessory kit (weighing approx. 0.9 kg). Other smoke control dampers with dimensions other than those of the reference smoke control damper reviewed here can be calculated by scaling the results using a weight table provided by *Wildeboer Bauteile GmbH*, and additional components (e.g. protective grilles, optional accessory kit) can also be added.

Declared unit

Name	Value	Unit
Declared unit	1	pce.
Ground reference	32.07	kg/pce.
Conversion factor to 1 kg	0.03118	-

3.2 System boundary

The "cradle to grave" EPD system boundary has a modular design according to /EN 15804:2011/. The LCA for the product under review considers the entire life cycle of the product and therefore all modules:

A1-A3 (Product stage): Raw material supply, transport to the manufacturer, production (incl. generation of energy, provision of ancillary materials, packaging material and disposal of waste).

A4-A5 (Construction process of a building): Transport to the building site, recycling packaging waste on the building site. Installation in the building is without the

use of further resources or the emergence of emissions.

B1-B5 (Use stage): No emissions are released when the smoke control damper is used (B1) at product level. The electric energy required for operation in the event of a fire is allocated to Module B6 as it can be regarded in connection with building operation. Maintenance (B2), repair (B3) or replacement of individual components (B4) are not of relevance during the service life under review. During the RSL (Reference Service Life), the smoke control damper does not require any refurbishment according to the manufacturer (B5). All modules within the use stage are therefore either irrelevant or not associated with environmental pollution and thus they are declared with a "0" value in terms of the LCA.

B6-B7 (Use stage - building operation): Use of electrical energy for operating the product.

C1-C4 (End-of-life stage): De-construction of the product, transport to waste treatment, waste processing, disposal. Analogue to installation, no effects on the environment are to be anticipated during de-construction of the product (C1). Transport to the disposal company (C2) was estimated at 75 km in this study. Waste is separated and sorted. Waste treatment of the various materials contained in the product was considered in Module C3 (with a recycling rate of 95%). Module C4 includes incineration, e.g. of plastic components, in a waste incineration plant. Landfilling of product components (e.g. calcium silicate and collection losses) was also allocated to Module C4.

D (Benefits and loads beyond the system boundary): In accordance with the /EN 15804/ standard, all declared benefits and loads from the net flows leaving the product system are allocated to Module D provided they have not reached end-of-waste status. Benefits arise for the electric and thermal energy generated by incinerating materials such as plastic contained in the product. Benefits are also incurred for metal contained in the product. The loads for the associated processing and remelting processes are allocated to Module D as it can be assumed that metal reaches end-of-waste status directly after the end of the use phase.

3.3 Estimates and assumptions

Until such a time as the total scrap input volume is reached, metal scrap incurred is redirected within Module A1-A3 *closed-loop*. Any more extensive scrap volumes are credited with the value of scrap in Module D.

During the Reference Service Life of approx. 20 years, no repairs (B3) of the smoke control damper, replacement of the damper components (B4) or substitution of the smoke control damper (B5) as a whole are required when used as designated in accordance with the manufacturer's instructions. Regular functional inspections of the smoke control damper's electric actuator (B2) involve so little effort that they are not considered in the LCA.

All processes at the end-of-life stage are depicted by partial flow analyses of the respective materials, whereby an R1 factor of less than 0.6 is assumed for all waste incineration plants. Combustible components such as plastic are recycled thermally at the end-of-life stage.

Environmental pollution incurred by incineration of the packaging and product in the EoL scenario is credited to the system (A5 or C4); ensuing credits for thermal and electric energy are declared in Module D.

Credits are awarded via average German data for electric energy and thermal energy from natural gas.

3.4 Cut-off criteria

All data from the operating data survey is taken into consideration, i.e. all starting materials used according to the composition, the electric energy used as well as waste volumes. Accordingly, material and energy flows accounting for a share of less than 1% are also considered.

The manufacture of machinery and equipment required by production, and infrastructure are not taken into consideration.

Regular functional inspections must be carried out on the electric actuator activated in the event of a fire. But they represent so little effort that they are not considered in the LCA.

3.5 Background data

/GaBi 6/ - the software system for comprehensive analysis developed by thinkstep AG - was used for modelling the life cycle of the product under review. The consistent data sets contained in the GaBi data base are documented and can be viewed in the online GaBi documentation.

3.6 Data quality

The data quality can be regarded as good for modelling. All relevant background data sets for the LCA were taken from the /GaBi 6/ software data base (2014); primary data was recorded by *Wildeboer Bauteile GmbH*. The appropriate data sets were available in the GaBi data base for all of the relevant preliminary products and ancillary materials used. The data sets used are representative in terms of geographic, time-based and technological coverage.

3.7 Period under review

The collation of primary data refers to 2014 (annual average) and was carried out by *Wildeboer Bauteile GmbH* at the Weener Location.

3.8 Allocation

The production process does not produce any by-products. Accordingly, no allocation is integrated in the software model on which it is based.

Total production by *Wildeboer Bauteile GmbH* comprises other products as well as the product declared here. While collating data, the values for electric energy as well as auxiliary materials referred to the product to be declared. This allocation was based on piece numbers.

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 forms the basis for the declared modules or can be used for developing specific scenarios within the context of a building evaluation.

Transport to construction site (A4)

Name	Value	Unit
Litres of fuel	0.053	l/100km
Transport distance	500	km
Capacity utilisation (including empty runs)	85	%

Construction installation process (A5)

Name	Value	Unit
Output materials following waste treatment on the building site (packaging waste)	2.24	kg

Maintenance (B1-B7)

Not of relevance for maintenance-free smoke control dampers.

Reference Service Life

Name	Value	Unit
Reference service life	20	a

End of Life (C1-C4)

Name	Value	Unit
Waste type collected separately	30.7	kg
For recycling	8.66	kg
For energy recovery	0.38	kg
For disposal	21.66	kg

Re-use, recovery and recycling potential (D), relevant scenario information

Metal and electronic components can be recycled.
Energy can be recovered from combustible components.

5. LCA: Results

The following tables depict the results of the indicators concerning the estimated impact, use of resources as well as waste and other output flows in relation to one EK90 smoke control damper (EK92 series) [32.07 kg/pce.], incl. electric actuator and standard accessory kit.

Data can be requested from the manufacturer or a calculation tool supplied by the manufacturer can be used for calculating (scaling) to other sizes and, if used, for optional protective grilles and/or accessory kit (www.wildeboer.de/epd).

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	X	X	X	X	X	X	X	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 EK90 smoke control damper (EK92 series) incl. electric actuator with a unit weight 32,07 kg/pce.

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	[kg CO ₂ -Eq.]	5.36E+1	8.14E-1	3.81E+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	1.22E-1	0.00E+0	7.90E-1	-1.93E+1
ODP	[kg CFC11-Eq.]	2.88E-9	8.23E-13	1.97E-12	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.23E-13	0.00E+0	7.98E-12	5.56E-11
AP	[kg SO ₂ -Eq.]	2.50E-1	1.70E-3	2.64E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.55E-4	0.00E+0	2.69E-3	-7.02E-2
EP	[kg (PO ₄) ³⁻ -Eq.]	2.14E-2	3.68E-4	6.26E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.52E-5	0.00E+0	3.76E-4	-6.01E-3
POCP	[kg ethene-Eq.]	2.17E-2	-5.66E-4	4.85E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-8.49E-5	0.00E+0	2.35E-4	-1.03E-2
ADPE	[kg Sb-Eq.]	4.99E-3	3.03E-8	2.70E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.55E-9	0.00E+0	2.06E-7	6.22E-5
ADPF	[MJ]	6.63E+2	1.13E+1	5.34E-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	1.69E+0	0.00E+0	5.34E+0	-1.89E+2

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 EK90 smoke control damper (EK92 series) incl. electric actuator with a unit weight 32,07 kg/pce.

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	9.13E+1	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND
PERM	[MJ]	0.00E+0	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND
PERT	[MJ]	9.13E+1	3.05E-2	7.07E-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	4.57E-3	0.00E+0	5.42E-1	-3.72E-2
PENRE	[MJ]	6.98E+2	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND
PENRM	[MJ]	7.96E+0	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND
PENRT	[MJ]	7.06E+2	1.13E+1	6.00E-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	1.70E+0	0.00E+0	5.59E+0	-1.85E+2
SM	[kg]	2.34E+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
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
FW	[m³]	2.66E-1	5.32E-5	6.58E-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	7.97E-6	0.00E+0	2.31E-3	-1.65E-2

Caption: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of non-renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of 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 EK90 smoke control damper (EK92 series) incl. electric actuator with a unit weight 32,07 kg/pce.

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	1.33E-4	2.90E-7	2.72E-7	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.34E-8	0.00E+0	1.74E-6	4.18E-6
NHWD	[kg]	2.93E+0	8.19E-5	4.19E-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	1.23E-5	0.00E+0	2.35E+1	-1.64E-1
RWD	[kg]	1.69E-2	1.20E-5	2.62E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.80E-6	0.00E+0	9.70E-5	1.44E-3
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
MFR	[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	8.66E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	1.37E+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	3.80E-1	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	1.38E+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	3.51E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	3.33E+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	8.62E+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

6. LCA: Interpretation

Components of steel and electronics (circuit boards and cables in the electric actuator) are dominant in all impact categories (except **PERT**). Their influence can be classified as relevant (>25%) to significant (>50%).

Brass displays a minor influence on the **ADP elements** indicator (consumption of non-renewable resources). The **PERT** (primary energy from renewable resources) is significantly influenced by packaging, incl. paper and wood products.

With the exception of **PERT**, the results are dominated by steel and electronics. For electronics, this is attributable in particular to the circuit board whose mass plays a subordinate role but its percentage of precious metals and rare earths cause it to display a high environmental impact. On the other hand, the environmental impacts of calcium silicate which accounts for the highest component of mass (23 kg) are rather unimportant in all impact categories (<10%). Accounting for a mass of 8 kg, the influence by steel is very important in all impact categories.

7. Requisite evidence

Evidence as per /PCR Part B/ is not relevant for the declared product.

8. References

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