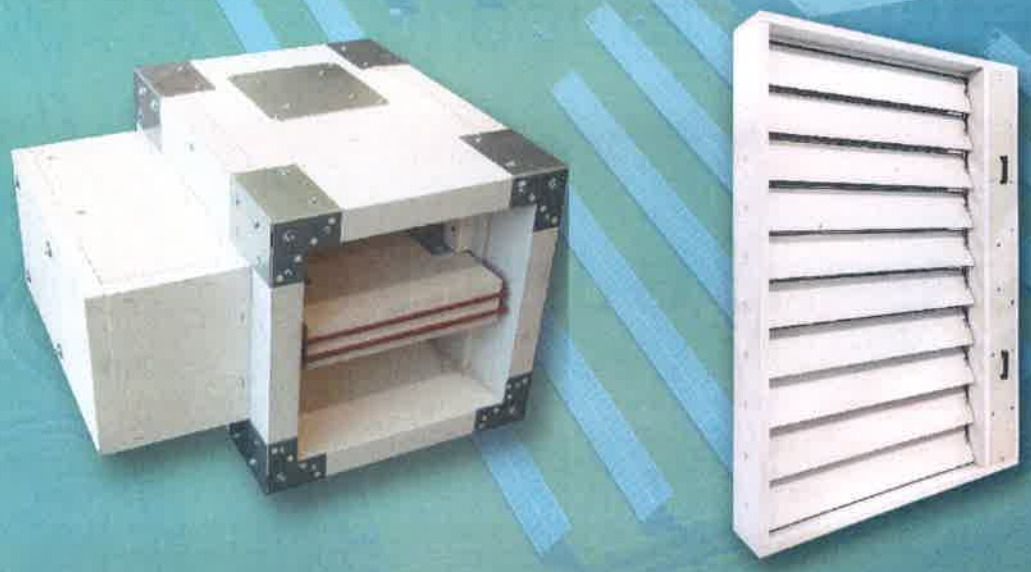
EPD Environmental product declaration

in accordance with ISO 14025:2006 and EN 15804:2012+A2:2019+AC:2021

SMOKE CONTROL DAMPERS

SEDM
SEDM-L



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Revision: 0

MANDÍK®

GENERAL INFORMATION

Programme	National Environmental Labelling Program (NPEZ)
Programme operator	MŽP, Ministry of the Environment of the Czech Republic
Contact	Vršovická 1442/65, Prague 10, 100 10 Czech Republic ekoznacka@mzp.cz www.ekoznacka.cz
LCA accountability	Lubos Nobilis, Nesuchyně 12, 270 07 Czech Republic nobilis.lubos@gmail.com
EPD owner	MANDÍK. a.s.

Product Category Rules (PCR)
CEN standard EN 15804 serve as the core Product Category Rules (PCR)
Third-party verification
Independent verification of the declaration and data, according to EN ISO 14025:2010: ☐ internal ☒ external
Third-party verifier: Building Research Institute – Certification company, Ltd. (Výzkumný ústav pozemních staveb – Certifikační společnost, s.r.o.) Pražská 810/16, 102 00 Praha 10, Czech Republic Jan Weinzettel, weinzettel@seznam.cz

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

COMPANY INFORMATION

Manufacturing company (the headquarters and the production site)	MANDÍK. a.s. Dobříšská 550, Hostomice 267 24 Czech Republic Registration Nº: 26718405 VAT Nº: CZ26718405
Contacts	Phone: +420 311 706 706 E-mail: mandik@mandik.cz Web: https://mandik.cz/

Company information

MANDÍK, a.s. is a Czech family-owned company founded in 1990. Currently, it is one of the major European manufacturers of fire protection and air handling components, central air–handling units and industrial heating systems.

The company has established itself on the European market through its emphasis on quality, affordability, a wide product portfolio and flexibility in processing customer requests for changes to existing products or the development of new products.

Emphasis is also placed on supporting customers and our deliveries with service and technical support. Customers can thus rely on the successful completion of any business case. The current technical and commercial maturity of the company is documented by deliveries for buildings of the world's largest technology companies, banks, office complexes, high-rise buildings and deliveries of technically demanding custom products for nuclear power plants, etc. across the entire European continent, including deliveries outside Europe.

Up-to-date information on certifications and declarations are on the company's website.

The headquarters and production plant of the company is located in Hostomice, in the district of Beroun, in Czech Republic.

MANDÍK®

PRODUCT INFORMATION

Smoke control dampers are designed into an extract smoke ventilation system. The dampers are designed to open (for fresh air inlet) to allow removal of the heat and combustible products from a fire in the affected fire zone/compartment.

The smoke and heat exhaust products are part of smoke and heat control systems from a SINGLE (from one compartment) or MULTI-affected areas (from several compartments). Smoke control dampers are always operated by an actuating mechanism.

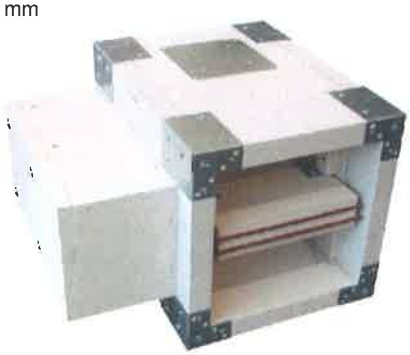
SEDM

CE 1391

TPM 087/12

Smoke control damper - MULTI

- Dimensions from 180 × 180 to 1 600 × 1 000 mm
- Fire resistance up to EI 120 S, activation AA/MA, HOT 400/30
- Damper actuating: electrical
- Max. air speed in the system 15 m/s, underpressure up to -1 500 Pa, or pressure up to 500 Pa
- Cycling test Cmod acc. to EN 12101-8
- Leakage acc. to EN 1751: casing class C / blade class 2
- CE certification acc. to EN 12101-8
- Tested acc. to EN 1366-10
- Classified acc. to EN 13501-4+A1



- Damper design:

Actuating mechanism

- Modulating actuators
- With communication and supply device

SEDM-L

CE 1391

TPM 146/20

Multileaf smoke control damper - MULTI

- Dimensions from 200 × 430 to 1 200 × 2 030 mm
- Fire resistance up to EI 120 S, activation AA/MA, HOT 400/30
- Damper actuating: electrical
- Max. air speed in the system 12 m/s, underpressure up to -1 000 Pa, pressure up to 500 Pa
- Cycling test Cmod acc. to EN 12101-8
- Leakage acc. to EN 1751: casing class C / blade class 3
- Corrosion resistance acc. to EN 15650
- CE certification acc. to EN 12101-8
- Tested acc. to EN 1366-10
- Classified acc. to EN 13501-4+A1

- Damper design:

Actuating mechanism

- Modulating actuators
- With communication and supply device

Detailed information is given in the technical specifications of the products available on the company's website.

MATERIAL CONTENT

Table 1: Material content of the product – SEDM

SEDM								
Dimension (mm)	180x180		800x500		1600x1000		Post-consumer recycled material, weight-%*	Biogenic material, weight-% and kg C/DU
Weight (kg/DU)	5.07		15.75		29.29			
	kg	%	kg	%	kg	%		
Steel	7.6067	22.27%	11.9101	12.52%	19.5808	8.41%	0	0
Calcium silicate board	25.1546	73.65%	81.6312	85.82%	202.7868	87.10%	0	0
Plastics and rubber	0.0588	0.17%	0.2092	0.22%	0.4172	0.18%	0	0
Electronics	0.8800	2.58%	0.8800	0.93%	9.5000	4.08%	0	0
Others (graphite, etc.)	0.4445	1.30%	0.4786	0.50%	0.5225	0.22%	0	0

** the recyclate content is not declared, a pessimistic scenario of 0 % content is considered*

Table 2: Material content of packaging – SEDM

SEDM									
Dimension (mm)	180x180			800x500			1600x1000		
Packaging	kg/DU	Weight-% (versus the product)	Weight biogenic carbon, kg C/DU	kg/DU	Weight-% (versus the product)	Weight biogenic carbon, kg C/DU	kg/DU	Weight-% (versus the product)	Weight biogenic carbon, kg C/DU
Cardboard	5.59E-01	1.64%	2.50E-01	1.56E+00	1.64%	6.96E-01	3.81E+00	1.64%	1.70E+00
PE	1.83E-01	0.54%	0	5.10E-01	0.54%	0	1.25E+00	0.54%	0
PVC	1.04E-01	0.30%	0	2.90E-01	0.30%	0	7.09E-01	0.30%	0
PP	2.51E-03	0.01%	0	6.98E-03	0.01%	0	1.71E-02	0.01%	0
Steel	1.97E-03	0.01%	0	5.48E-03	0.01%	0	1.34E-02	0.01%	0
Wood	1.93E-01	13.56%	8.62E-02	5.38E-01	13.56%	2.40E-01	1.32E+00	13.56%	5.89E-01
Total	1.04E+00	16.05%	3.36E-01	2.91E+00	16.05%	9.37E-01	7.11E+00	16.05%	2.29E+00

Table 3: Material content of the product – SEDM-L

SEDM-L								
Dimension (mm)	200x430		600x1030		1200x2030		Post-consumer recycled material, weight-%*	Biogenic material, weight-% and kg C/DU
Weight (kg/DU)	36.51		94.60		226.20			
	kg	%	kg	%	kg	%		
Steel	31.79773	87.01%	84.35896	95.77%	203.18746	96.06%	0	0
Calcium silicate board	3.36314	9.20%	1.42693	1.62%	2.81087	1.33%	0	0
Plastics and rubber	0.88000	2.41%	1.10000	1.25%	2.81087	1.33%	0	0
Electronics	0.11780	0.32%	0.23290	0.26%	0.29140	0.14%	0	0
Others (graphite, etc.)	0.38555	1.06%	0.96355	1.09%	2.43155	1.15%	0	0

** the recyclate content is not declared, a pessimistic scenario of 0 % content is considered*

Table 4: Material content of packaging – SEDM-L

SEDM-L									
Dimension (mm)	200x430			600x1030			1200x2030		
Packaging	kg/DU	Weight-% (versus the product)	Weight biogenic carbon, kg C/DU	kg/DU	Weight-% (versus the product)	Weight biogenic carbon, kg C/DU	kg/DU	Weight-% (versus the product)	Weight biogenic carbon, kg C/DU
Cardboard	5.98E-01	1.64%	2.67E-01	1.55E+00	1.64%	6.92E-01	3.70E+00	1.64%	1.65E+00
PE	1.96E-01	0.54%	0	5.07E-01	0.54%	0	1.21E+00	0.54%	0
PVC	1.11E-01	0.30%	0	2.88E-01	0.30%	0	6.89E-01	0.30%	0
PP	2.68E-03	0.01%	0	6.95E-03	0.01%	0	1.66E-02	0.01%	0
Steel	2.10E-03	0.01%	0	5.45E-03	0.01%	0	1.30E-02	0.01%	0
Wood	2.06E-01	13.56%	9.20E-02	5.35E-01	13.56%	2.39E-01	1.28E+00	13.56%	5.71E-01
Total	1.12E+00	16.05%	3.59E-01	2.89E+00	16.05%	9.31E-01	6.91E+00	16.05%	2.22E+00

LCA INFORMATION

Declared unit:	1 pc of smoke control dampers of a specific type
Reference service life:	20 years (used for calculation of energy consumption in the use phase)
Geografilcal scope:	Stage A1-A3 Europe, A4-C4 Global
Time representativeness:	2022
Database(s) and LCA software used:	Ecoinvent 3.9 (using the Cut-off processes/allocation model), Simapro v. 9.5 EN 15804 reference package based on EF 3.1
Cut-off rules:	Neglected flow in all modules is less than 1% of the energy use and total mass.
Allocation method:	Weight allocations: A3 energy/fuels consumption, waste and air emissions outputs are allocated by total products (smoke control dampers) manufactured over 1 year
Description of system boundaries:	The type of EPD is Cradle to Grave and module D (EPD Type c - Modules A1-A3, A4-A5, B1-B7, C1-C4, and D)
Infrastructure/capital goods:	Infrastructure is part of the generic processes used for upstream and downstream. For the Core phase, infrastructure was not considered.
Determination of representatives:	The EPD is related to the representatives of the size range of individual product types – the smallest, medium and largest size. The results are divided by the type of installation (module A5) - using mortar or mineral wool.

Production stage (A1-A3)

The A1 module contains primarily the production of components for the assembly of complete smoke control dampers. These are profiles and components made of fire protection board (based on calcium silicate) and steel, then plastics and electronics. Furthermore, it concerns the production of electricity, the extraction and distribution of natural gas, and the production of fuels and operational inputs for production.
Phase A2 includes the transportation of the above-mentioned materials and components to production in phase A3.
In production (A3), the processing of purchased materials takes place, especially formatting of calcium silicate boards, formatting, punching, plasma cutting, welding, etc. of galvanized sheets, other metals. This is related to the consumption of electricity, natural gas and fuels for internal and commercial transport and emissions from their use.
PE foil, PVC, PP, cardboard, wood (disposable pallets) and steel are used for product packaging.
Production generates waste from production (CDW - scraps and dust of calcium silicate boards, iron and steel, plastics) and waste packaging (plastics, paper and cardboard, mixed).

Transport to construction stage (A4)

The A4 module represents transport to customers around the world in the reference year. The truck, 16-32 t, diesel, consupmption 38 l per 100 km, EURO 6, are considered. The distance is given by a summary of specific transports for the product line.

Construction-Installation (A5)

In phase A5, the generation of waste from product packaging is considered. The installation of smoke control dampers to building is considered as manual and in two variants - with the consumption of walling material (mortar) or fire-resistance board of mineral wool. In the case of mortar, water consumption is considered. There are output materials as result of waste processing at the building site - packaging waste (cardboard, PE, PP, PVC, steel), their quantity is determined by the type of product.

Use stage (B1-B7)

In the use phase, the operating electrical energy consumption of the motor in module B6 is considered. On the basis of expert estimation, a service life of 20 years with continuous operation is considered for the calculation. The technical specifications of the product state that serviceability checks are carried out twice a year, but for the calculation of the LCA, an interval of once a week was used (more realistic estimation). Depending on the type of actuator, active operation of 30/60 s 1x/week and the remaining time in stand-by mode was considered. The power output of the actuator depends on the parameters of the specific type.

The usage module (B1) is without inputs and outputs, as is the operational water consumption (B7). The repair (B3) and replacement (B4) modules are modeled without inputs and outputs, as these situations may occur, but do not result directly from the requirements for using the product. Cleaning may occur in the maintenance module (B2), but it is not specified in technical specifications.

End-of-Life stage (C1-C4)

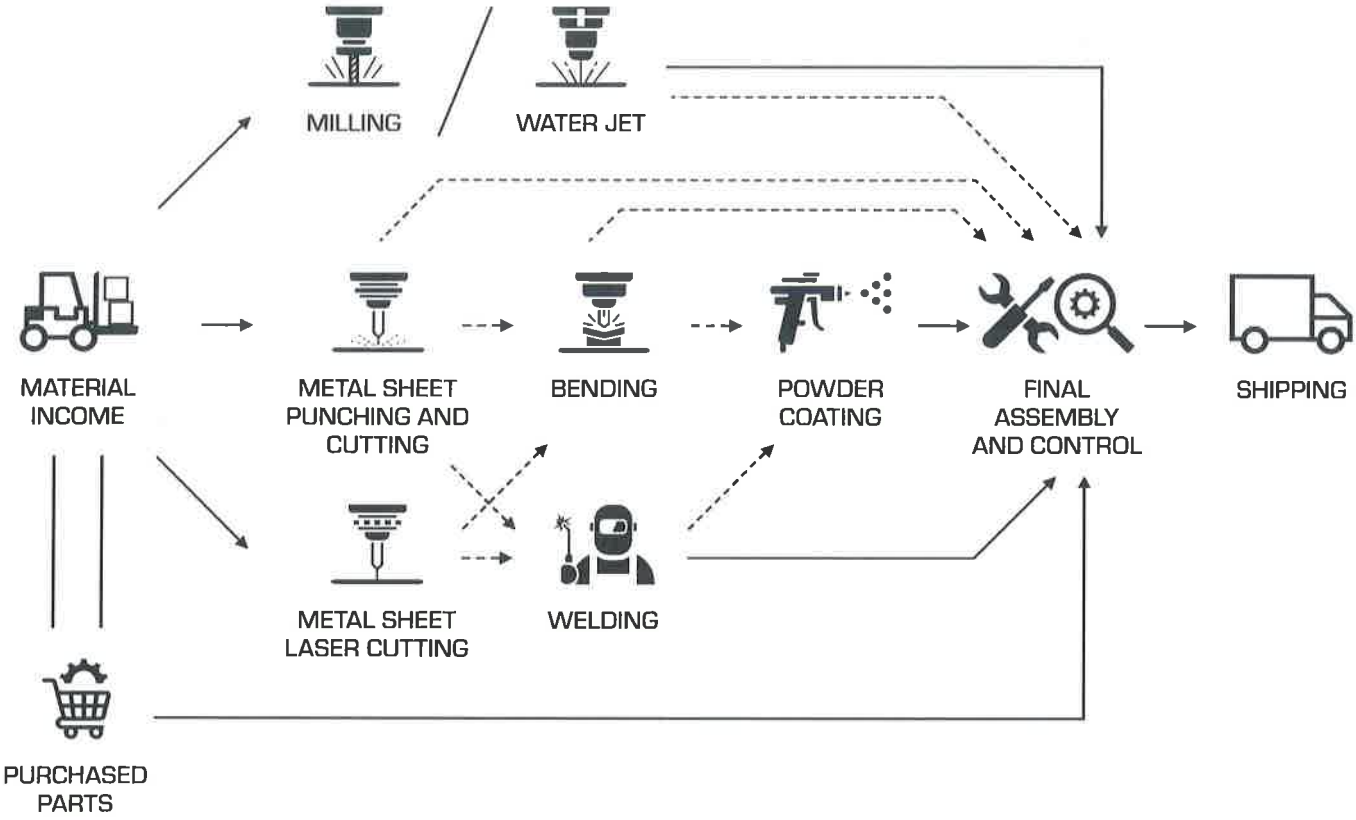
In the C1 and C2 modules, manual deconstruction and transport for processing at a distance of 50 km is considered. All electronic equipment is collected separately and handed over for take-back.
In the C3 module, the recycling of metal and electronic components (70 %), the energy use of plastics (1 %) and the landfilling of the remaining materials (29 %) are calculated.

Benefits and loads beyond the system boundary (D) - Reuse, Recovery, Recycling potentials

Benefits and costs beyond the boundary of the product system correspond to the replacement of primary materials and energy due to the generation of metal recycle and electricity and heat from energy use in phase C3.

Specific technical information for scenarios of a specific product type will be provided by the company upon request.

SYSTEM DIAGRAM



SYSTEM BOUNDARIES

	Product stage			Construction stage		Use stage	End of life stage				Benefits and loads beyond the system boundary
	Raw material supply	Transport	Manufacturing	Transport	Construction-Installation process	Use Maintenance Repair Replacement Refurbishment Operational energy use Operational water use	De-construction / demolition	Transport	Waste processing	Disposal	Reuse-recovery
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

X – module declared
ND – module not declared

LCA RESULTS

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.
It is not recommended to use the results of modules A1-A3 without considering the results of module C.

Table 5: Core environmental impact indicators - SEDM, 180x180 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Climate change - Fossil	kg CO2 eq	8,91E+01	7,11E+00	9,32E+00	1,49E+01	4,71E+01	3,16E-01	3,72E-01	3,00E-01	-1,36E+01
Climate change - Biogenic	kg CO2 eq	-8,34E+00	6,52E-03	5,18E-01	1,09E-01	4,47E-01	2,89E-04	5,57E-07	1,91E-03	-2,94E-02
Climate change - Land use and LU change	kg CO2 eq	7,18E-02	3,51E-03	2,78E-03	2,67E-02	6,39E-02	1,56E-04	1,47E-05	2,18E-04	-9,15E-03
Climate change	kg CO2 eq	8,09E+01	7,12E+00	9,84E+00	1,51E+01	4,76E+01	3,16E-01	3,71E-01	3,02E-01	-1,37E+01
GWP-GHG	kg CO2-eq	8,58E+01	7,12E+00	9,33E+00	1,51E+01	4,72E+01	3,16E-01	3,72E-01	3,01E-01	-1,36E+01
Ozone depletion	kg CFC11 eq	4,45E-06	1,55E-07	2,82E-08	4,07E-07	3,38E-07	6,88E-09	4,81E-10	7,09E-09	-2,39E-07
Acidification	mol H+ eq	5,77E-01	1,55E-02	4,02E-02	1,02E-01	2,11E-01	6,91E-04	1,75E-04	2,13E-03	-6,17E-02
Eutrophication, freshwater*	kg P eq	3,65E-02	5,06E-04	1,75E-03	5,53E-03	7,37E-02	2,25E-05	4,79E-06	7,86E-05	-6,66E-03
Eutrophication, marine	kg N eq	1,03E-01	3,92E-03	7,45E-03	1,89E-02	4,58E-02	1,74E-04	6,92E-05	7,98E-04	-1,42E-02
Eutrophication, terrestrial	mol N eq	1,77E+00	3,99E-02	8,09E-02	3,02E-01	3,39E-01	1,77E-03	7,52E-04	8,54E-03	-1,44E-01
Photochemical ozone formation	kg NMVOC eq	3,42E-01	2,41E-02	2,37E-02	6,23E-02	9,96E-02	1,07E-03	1,57E-04	2,89E-03	-6,49E-02
Resource use, minerals and metals*	kg Sb eq	1,49E-03	2,33E-05	9,88E-06	2,44E-04	3,06E-04	1,03E-06	1,61E-07	6,09E-07	-9,75E-05
Resource use, fossils*	MJ	1,11E+03	1,01E+02	5,41E+01	2,17E+02	7,61E+02	4,49E+00	1,66E-01	6,50E+00	-1,45E+02
Water use*	m^3 depriv.	1,68E+01	4,17E-01	1,81E+00	5,72E+00	8,08E+00	1,85E-02	8,49E-03	2,75E-01	9,78E-01

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Table 6: Additional environmental impact indicators - SEDM, 180x180 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Particulate matter	disease inc.	6,16E-06	5,30E-07	5,89E-07	9,31E-07	5,09E-07	2,35E-08	1,81E-09	4,60E-08	-1,18E-06
Human toxicity, non-cancer*	CTUh	1,74E-06	7,17E-08	5,46E-08	1,60E-07	5,33E-07	3,18E-09	3,96E-09	1,88E-09	-3,07E-07
Human toxicity, cancer*	CTUh	1,85E-07	3,24E-09	2,20E-09	4,72E-08	1,56E-08	1,44E-10	4,48E-11	1,68E-10	-1,09E-07
Land use*	Pt	7,86E+02	6,11E+01	4,42E+01	4,45E+01	7,89E+01	2,71E+00	3,36E-01	1,48E+01	-4,75E+01
Ionising radiation**	kBq U-235 eq	7,64E+00	1,37E-01	4,02E-01	1,46E+00	1,97E+01	6,07E-03	6,73E-04	8,57E-03	-4,58E-01
Ecotoxicity, freshwater	CTUe	8,45E+02	4,99E+01	1,73E+01	6,78E+01	1,67E+02	2,22E+00	2,58E+00	2,85E+00	-7,69E+01

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.
** Disclaimer: This impact category deals mainly with the eventual impact of low dose ionising radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionising radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Table 7: Parameters describing resource use - SEDM, 180x180 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Use of renewable primary energy excl. raw materials	MJ, net calorific value	1,34E+02	1,59E+00	1,18E+01	1,92E+01	5,19E+01	7,05E-02	2,94E-02	1,12E-01	-1,30E+01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	1,34E+02	1,59E+00	1,18E+01	1,92E+01	5,19E+01	7,05E-02	2,94E-02	1,12E-01	-1,30E+01
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	8,28E+02	1,07E+02	5,70E+01	2,33E+02	8,06E+02	4,77E+00	1,78E-01	6,91E+00	-1,53E+02
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	8,28E+02	1,07E+02	5,70E+01	2,33E+02	8,06E+02	4,77E+00	1,78E-01	6,91E+00	-1,53E+02
Use of secondary material	kg	0	0	0	0	0	0	0	0	0
Use of renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Use of net fresh water	m3	4,07E-01	1,18E-02	3,01E-02	4,12E-04	3,09E-01	5,22E-04	4,53E-04	8,43E-04	-1,06E-01

Table 8: Other environmental information describing waste categories - SEDM, 180x180 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Hazardous waste	kg	5,84E-02	2,53E-03	1,01E-02	4,09E-02	5,74E-02	1,12E-04	5,87E-03	1,62E-04	-3,88E-03
Non-hazardous waste disposed	kg	2,51E+01	5,02E+00	5,23E-01	1,71E+00	4,64E+00	2,23E-01	1,57E-02	2,57E+01	-6,05E+00
Radioactive waste disposed/stored	kg	1,72E-03	3,32E-05	9,14E-05	3,57E-04	4,72E-03	1,48E-06	1,66E-07	2,06E-06	-1,14E-04

Table 9: Environmental information describing output flows - SEDM, 180x180 mm

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0
Materials for recycling	kg	0	0	6,20E-01	0	0	8,49E+00	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	2,30E-01	0	0
Exported energy, heat	MJ	0	0	0	0	0	4,50E-01	0	0

Table 10: Core environmental impact indicators - SEDM, 800x500 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Climate change - Fossil	kg CO2 eq	2,39E+02	1,98E+01	2,29E+01	3,64E+01	4,71E+01	8,79E-01	7,28E-01	9,62E-01	-2,14E+01
Climate change - Biogenic	kg CO2 eq	-2,51E+01	1,81E-02	1,27E+00	2,66E-01	4,47E-01	8,06E-04	7,11E-07	6,12E-03	-4,67E-02
Climate change - Land use and LU change	kg CO2 eq	1,81E-01	9,76E-03	6,82E-03	6,49E-02	6,39E-02	4,34E-04	1,65E-05	7,00E-04	-1,44E-02
Climate change	kg CO2 eq	2,15E+02	1,98E+01	2,42E+01	3,67E+01	4,76E+01	8,81E-01	7,27E-01	9,69E-01	-2,15E+01
GWP-GHG	kg CO2-eq	2,28E+02	1,98E+01	2,29E+01	3,67E+01	4,72E+01	8,80E-01	7,28E-01	9,65E-01	-2,14E+01
Ozone depletion	kg CFC11 eq	1,29E-05	4,31E-07	6,92E-08	9,91E-07	3,38E-07	1,92E-08	8,79E-10	2,27E-08	-3,75E-07
Acidification	mol H+ eq	1,24E+00	4,32E-02	9,87E-02	2,49E-01	2,11E-01	1,92E-03	2,52E-04	6,84E-03	-9,66E-02
Eutrophication, freshwater*	kg P eq	9,12E-02	1,41E-03	4,31E-03	1,35E-02	7,37E-02	6,25E-05	5,56E-06	2,52E-04	-1,05E-02
Eutrophication, marine	kg N eq	2,62E-01	1,09E-02	1,83E-02	4,60E-02	4,58E-02	4,85E-04	1,15E-04	2,56E-03	-2,22E-02
Eutrophication, terrestrial	mol N eq	3,77E+00	1,11E-01	1,99E-01	7,35E-01	3,39E-01	4,93E-03	1,14E-03	2,74E-02	-2,25E-01
Photochemical ozone formation	kg NMVOC eq	8,52E-01	6,71E-02	5,82E-02	1,52E-01	9,96E-02	2,98E-03	2,53E-04	9,26E-03	-1,02E-01
Resource use, minerals and metals*	kg Sb eq	2,18E-03	6,46E-05	2,43E-05	5,95E-04	3,06E-04	2,87E-06	1,74E-07	1,95E-06	-1,52E-04
Resource use, fossils*	MJ	3,00E+03	2,81E+02	1,33E+02	5,29E+02	7,61E+02	1,25E+01	2,19E-01	2,08E+01	-2,28E+02
Water use*	m^3 depriv.	4,56E+01	1,16E+00	4,44E+00	1,39E+01	8,08E+00	5,15E-02	1,04E-02	8,82E-01	1,51E+00

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Table 11: Additional environmental impact indicators - SEDM, 800x500 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Particulate matter	disease inc.	1,16E-05	1,47E-06	1,45E-06	2,27E-06	5,09E-07	6,55E-08	2,15E-09	1,47E-07	-1,84E-06
Human toxicity, non-cancer*	CTUh	3,03E-06	1,99E-07	1,34E-07	3,90E-07	5,33E-07	8,86E-09	4,80E-09	6,02E-09	-4,80E-07
Human toxicity, cancer*	CTUh	3,13E-07	9,01E-09	5,40E-09	1,15E-07	1,56E-08	4,01E-10	6,48E-11	5,37E-10	-1,71E-07
Land use*	Pt	2,14E+03	1,70E+02	1,09E+02	1,08E+02	7,89E+01	7,55E+00	3,51E-01	4,76E+01	-7,41E+01
Ionising radiation**	kBq U-235 eq	2,28E+01	3,80E-01	9,87E-01	3,56E+00	1,97E+01	1,69E-02	8,54E-04	2,75E-02	-7,52E-01
Ecotoxicity, freshwater	CTUe	2,09E+03	1,39E+02	4,26E+01	1,65E+02	1,67E+02	6,18E+00	3,34E+00	9,13E+00	-1,20E+02

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** Disclaimer: This impact category deals mainly with the eventual impact of low dose ionising radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionising radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Table 12: Parameters describing resource use - SEDM, 800x500 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Use of renewable primary energy excl. raw materials	MJ, net calorific value	3,45E+02	4,41E+00	2,89E+01	4,67E+01	5,19E+01	1,96E-01	3,25E-02	3,58E-01	-2,04E+01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	3,45E+02	4,41E+00	2,89E+01	4,67E+01	5,19E+01	1,96E-01	3,25E-02	3,58E-01	-2,04E+01
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	2,06E+03	2,98E+02	1,40E+02	5,68E+02	8,06E+02	1,33E+01	2,35E-01	2,22E+01	-2,41E+02
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	2,06E+03	2,98E+02	1,40E+02	5,68E+02	8,06E+02	1,33E+01	2,35E-01	2,22E+01	-2,41E+02
Use of secondary material	kg	0	0	0	0	0	0	0	0	0
Use of renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Use of net fresh water	m3	1,13E+00	3,27E-02	8,35E-02	5,23E-03	8,58E-01	1,45E-03	1,26E-03	2,34E-03	-2,94E-01

Table 13: Other environmental information describing waste categories - SEDM, 800x500 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Hazardous waste	kg	1,21E-01	7,03E-03	2,48E-02	9,95E-02	5,74E-02	3,13E-04	9,87E-03	5,19E-04	-6,14E-03
Non-hazardous waste disposed	kg	6,08E+01	1,39E+01	1,31E+00	4,19E+00	4,64E+00	6,21E-01	2,06E-02	8,23E+01	-9,45E+00
Radioactive waste disposed/stored	kg	5,08E-03	9,23E-05	2,24E-04	8,70E-04	4,72E-03	4,11E-06	2,11E-07	6,62E-06	-1,87E-04

Table 14: Environmental information describing output flows - SEDM, 800x500 mm

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0
Materials for recycling	kg	0	0	1,73E+00	0	0	1,28E+01	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	8,20E-01	0	0
Exported energy, heat	MJ	0	0	0	0	0	1,60E+00	0	0

Table 15: Core environmental impact indicators - SEDM, 1600x1000 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Climate change - Fossil	kg CO2 eq	5,79E+02	4,84E+01	4,19E+01	6,50E+01	5,88E+02	2,14E+00	3,50E+00	2,38E+00	-3,56E+01
Climate change - Biogenic	kg CO2 eq	-6,03E+01	4,43E-02	2,33E+00	4,76E-01	5,59E+00	1,96E-03	5,80E-07	1,51E-02	-7,78E-02
Climate change - Land use and LU change	kg CO2 eq	4,63E-01	2,39E-02	1,25E-02	1,16E-01	7,98E-01	1,06E-03	1,56E-04	1,73E-03	-2,46E-02
Climate change	kg CO2 eq	5,20E+02	4,85E+01	4,42E+01	6,56E+01	5,95E+02	2,15E+00	3,49E+00	2,40E+00	-3,57E+01
GWP-GHG	kg CO2-eq	5,54E+02	4,84E+01	4,19E+01	6,56E+01	5,89E+02	2,14E+00	3,50E+00	2,39E+00	-3,56E+01
Ozone depletion	kg CFC11 eq	2,97E-05	1,05E-06	1,27E-07	1,77E-06	4,22E-06	4,67E-08	4,62E-09	5,62E-08	-6,24E-07
Acidification	mol H+ eq	3,21E+00	1,06E-01	1,81E-01	4,44E-01	2,64E+00	4,68E-03	1,77E-03	1,69E-02	-1,61E-01
Eutrophication, freshwater*	kg P eq	2,26E-01	3,44E-03	7,89E-03	2,41E-02	9,21E-01	1,52E-04	5,05E-05	6,23E-04	-1,74E-02
Eutrophication, marine	kg N eq	6,47E-01	2,67E-02	3,36E-02	8,23E-02	5,73E-01	1,18E-03	6,81E-04	6,33E-03	-3,73E-02
Eutrophication, terrestrial	mol N eq	8,51E+00	2,71E-01	3,64E-01	1,31E+00	4,24E+00	1,20E-02	7,56E-03	6,77E-02	-3,78E-01
Photochemical ozone formation	kg NMVOC eq	2,15E+00	1,64E-01	1,07E-01	2,71E-01	1,24E+00	7,27E-03	1,55E-03	2,29E-02	-1,70E-01
Resource use, minerals and metals*	kg Sb eq	9,40E-03	1,58E-04	4,44E-05	1,06E-03	3,82E-03	7,01E-06	1,72E-06	4,83E-06	-2,51E-04
Resource use, fossils*	MJ	7,10E+03	6,88E+02	2,43E+02	9,46E+02	9,51E+03	3,04E+01	1,72E+00	5,15E+01	-3,80E+02
Water use*	m^3 depriv.	1,21E+02	2,83E+00	8,13E+00	2,49E+01	1,01E+02	1,25E-01	8,89E-02	2,18E+00	2,46E+00

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Table 16: Additional environmental impact indicators - SEDM, 1600x1000 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Particulate matter	disease inc.	2,64E-05	3,61E-06	2,65E-06	4,05E-06	6,35E-06	1,60E-07	1,90E-08	3,65E-07	-3,07E-06
Human toxicity, non-cancer*	CTUh	1,22E-05	4,88E-07	2,46E-07	6,97E-07	6,66E-06	2,16E-08	4,15E-08	1,49E-08	-7,93E-07
Human toxicity, cancer*	CTUh	7,65E-07	2,21E-08	9,88E-09	2,05E-07	1,95E-07	9,77E-10	4,55E-10	1,33E-09	-2,81E-07
Land use*	Pt	5,67E+03	4,16E+02	1,99E+02	1,94E+02	9,87E+02	1,84E+01	3,61E+00	1,18E+02	-1,25E+02
Ionising radiation**	kBq U-235 eq	4,92E+01	9,31E-01	1,81E+00	6,36E+00	2,46E+02	4,12E-02	7,01E-03	6,79E-02	-1,27E+00
Ecotoxicity, freshwater	CTUe	5,64E+03	3,40E+02	7,85E+01	2,96E+02	2,08E+03	1,50E+01	2,67E+01	2,26E+01	-2,01E+02

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Table 17: Parameters describing resource use - SEDM, 1600x1000 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Use of renewable primary energy excl. raw materials	MJ, net calorific value	8,44E+02	1,08E+01	5,29E+01	8,34E+01	6,48E+02	4,78E-01	3,13E-01	8,85E-01	-3,37E+01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	8,44E+02	1,08E+01	5,29E+01	8,34E+01	6,48E+02	4,78E-01	3,13E-01	8,85E-01	-3,37E+01
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	4,82E+03	7,31E+02	2,56E+02	1,02E+03	1,01E+04	3,24E+01	1,84E+00	5,48E+01	-4,03E+02
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	4,82E+03	7,31E+02	2,56E+02	1,02E+03	1,01E+04	3,24E+01	1,84E+00	5,48E+01	-4,03E+02
Use of secondary material	kg	0	0	0	0	0	0	0	0	0
Use of renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Use of net fresh water	m3	2,78E+00	8,02E-02	2,05E-01	9,23E-03	2,11E+00	3,56E-03	3,09E-03	5,75E-03	-7,22E-01

Table 18: Other environmental information describing waste categories - SEDM, 1600x1000 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Hazardous waste	kg	3,37E-01	1,72E-02	4,54E-02	1,78E-01	7,17E-01	7,62E-04	5,75E-02	1,28E-03	-1,03E-02
Non-hazardous waste disposed	kg	1,46E+02	3,42E+01	2,55E+00	7,65E+00	5,80E+01	1,51E+00	1,63E-01	2,04E+02	-1,58E+01
Radioactive waste disposed/stored	kg	1,08E-02	2,26E-04	4,11E-04	1,55E-03	5,90E-02	1,00E-05	1,73E-06	1,64E-05	-3,14E-04

Table 19: Environmental information describing output flows - SEDM, 1600x1000 mm

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0
Materials for recycling	kg	0	0	4,23E+00	0	0	2,91E+01	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	1,64E+00	0	0
Exported energy, heat	MJ	0	0	0	0	0	3,20E+00	0	0

Table 20: Core environmental impact indicators - SEDM-L, 200x430 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Climate change - Fossil	kg CO2 eq	9,07E+01	5,80E+00	6,74E+00	3,21E+01	4,71E+01	3,38E-01	2,67E-01	3,74E-01	-6,42E+00
Climate change - Biogenic	kg CO2 eq	-1,01E+01	5,31E-03	3,75E-01	2,35E-01	4,47E-01	3,10E-04	1,28E-07	2,38E-03	-1,58E-02
Climate change - Land use and LU change	kg CO2 eq	6,76E-02	2,86E-03	2,01E-03	5,73E-02	6,39E-02	1,67E-04	1,42E-05	2,72E-04	-4,96E-03
Climate change	kg CO2 eq	8,08E+01	5,81E+00	7,11E+00	3,24E+01	4,76E+01	3,39E-01	2,66E-01	3,76E-01	-6,44E+00
GWP-GHG	kg CO2-eq	8,61E+01	5,80E+00	6,75E+00	3,24E+01	4,72E+01	3,38E-01	2,67E-01	3,75E-01	-6,43E+00
Ozone depletion	kg CFC11 eq	5,29E-06	1,26E-07	2,04E-08	8,76E-07	3,38E-07	7,36E-09	3,64E-10	8,83E-09	-1,10E-07
Acidification	mol H+ eq	4,74E-01	1,27E-02	2,91E-02	2,20E-01	2,11E-01	7,39E-04	1,52E-04	2,66E-03	-5,49E-02
Eutrophication, freshwater*	kg P eq	3,46E-02	4,12E-04	1,27E-03	1,19E-02	7,37E-02	2,40E-05	4,56E-06	9,79E-05	-5,12E-03
Eutrophication, marine	kg N eq	9,96E-02	3,20E-03	5,40E-03	4,06E-02	4,58E-02	1,86E-04	5,57E-05	9,95E-04	-7,75E-03
Eutrophication, terrestrial	mol N eq	1,27E+00	3,25E-02	5,85E-02	6,49E-01	3,39E-01	1,89E-03	6,38E-04	1,06E-02	-8,37E-02
Photochemical ozone formation	kg NMVOC eq	3,28E-01	1,97E-02	1,71E-02	1,34E-01	9,96E-02	1,15E-03	1,28E-04	3,60E-03	-3,44E-02
Resource use, minerals and metals*	kg Sb eq	1,45E-03	1,90E-05	7,14E-06	5,26E-04	3,06E-04	1,11E-06	1,57E-07	7,58E-07	-4,22E-04
Resource use, fossils*	MJ	1,14E+03	8,24E+01	3,91E+01	4,67E+02	7,61E+02	4,80E+00	1,51E-01	8,09E+00	-6,90E+01
Water use*	m^3 depriv.	1,79E+01	3,40E-01	1,31E+00	1,23E+01	8,08E+00	1,98E-02	7,93E-03	3,43E-01	-6,84E-03

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Table 21: Additional environmental impact indicators - SEDM-L, 200x430 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Particulate matter	disease inc.	4,24E-06	4,32E-07	4,26E-07	2,00E-06	5,09E-07	2,52E-08	1,71E-09	5,73E-08	-5,88E-07
Human toxicity, non-cancer*	CTUh	1,82E-06	5,85E-08	3,95E-08	3,44E-07	5,33E-07	3,41E-09	3,71E-09	2,34E-09	-5,03E-07
Human toxicity, cancer*	CTUh	1,15E-07	2,64E-09	1,59E-09	1,01E-07	1,56E-08	1,54E-10	3,89E-11	2,09E-10	-5,27E-08
Land use*	Pt	7,67E+02	4,98E+01	3,20E+01	9,56E+01	7,89E+01	2,90E+00	3,32E-01	1,85E+01	-3,01E+01
Ionising radiation**	kBq U-235 eq	7,64E+00	1,12E-01	2,91E-01	3,14E+00	1,97E+01	6,50E-03	6,20E-04	1,07E-02	-2,48E-01
Ecotoxicity, freshwater	CTUe	7,71E+02	4,07E+01	1,26E+01	1,45E+02	1,67E+02	2,37E+00	2,35E+00	3,55E+00	-7,38E+01

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Table 22: Parameters describing resource use - SEDM-L, 200x430 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Use of renewable primary energy excl. raw materials	MJ, net calorific value	1,31E+02	1,30E+00	8,50E+00	4,12E+01	5,19E+01	7,55E-02	2,85E-02	1,39E-01	-7,04E+00
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	1,31E+02	1,30E+00	8,50E+00	4,12E+01	5,19E+01	7,55E-02	2,85E-02	1,39E-01	-7,04E+00
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	7,52E+02	8,76E+01	4,12E+01	5,02E+02	8,06E+02	5,10E+00	1,62E-01	8,61E+00	-7,30E+01
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	7,52E+02	8,76E+01	4,12E+01	5,02E+02	8,06E+02	5,10E+00	1,62E-01	8,61E+00	-7,30E+01
Use of secondary material	kg	0	0	0	0	0	0	0	0	0
Use of renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Use of net fresh water	m3	4,35E-01	1,26E-02	3,21E-02	4,25E-04	3,30E-01	5,59E-04	4,84E-04	9,01E-04	-1,13E-01

Table 23: Other environmental information describing waste categories - SEDM-L, 200x430 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Hazardous waste	kg	4,67E-02	2,06E-03	7,30E-03	8,79E-02	5,74E-02	1,20E-04	4,69E-03	2,01E-04	-2,59E-03
Non-hazardous waste disposed	kg	2,36E+01	4,09E+00	4,08E-01	3,58E+00	4,64E+00	2,39E-01	1,43E-02	3,20E+01	-2,84E+00
Radioactive waste disposed/stored	kg	1,68E-03	2,71E-05	6,61E-05	7,68E-04	4,72E-03	1,58E-06	1,53E-07	2,57E-06	-6,23E-05

Table 24: Environmental information describing output flows - SEDM-L, 200x430 mm

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0
Materials for recycling	kg	0	0	6,63E-01	0	0	4,32E+00	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	5,64E-02	0	0
Exported energy, heat	MJ	0	0	0	0	0	1,10E-01	0	0

Table 25: Core environmental impact indicators - SEDM-L, 600x1030 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Climate change - Fossil	kg CO2 eq	2,30E+02	1,50E+01	1,43E+01	5,49E+01	4,71E+01	8,74E-01	3,25E-01	9,94E-01	-1,56E+01
Climate change - Biogenic	kg CO2 eq	-2,64E+01	1,38E-02	7,94E-01	4,02E-01	4,47E-01	8,01E-04	4,93E-08	6,32E-03	-3,85E-02
Climate change - Land use and LU change	kg CO2 eq	1,64E-01	7,43E-03	4,25E-03	9,80E-02	6,39E-02	4,31E-04	1,77E-05	7,23E-04	-1,20E-02
Climate change	kg CO2 eq	2,04E+02	1,51E+01	1,51E+01	5,54E+01	4,76E+01	8,75E-01	3,24E-01	1,00E+00	-1,57E+01
GWP-GHG	kg CO2-eq	2,17E+02	1,50E+01	1,43E+01	5,54E+01	4,72E+01	8,74E-01	3,25E-01	9,96E-01	-1,56E+01
Ozone depletion	kg CFC11 eq	1,41E-05	3,28E-07	4,32E-08	1,50E-06	3,38E-07	1,90E-08	4,45E-10	2,35E-08	-2,70E-07
Acidification	mol H+ eq	1,12E+00	3,29E-02	6,16E-02	3,75E-01	2,11E-01	1,91E-03	1,88E-04	7,07E-03	-1,35E-01
Eutrophication, freshwater*	kg P eq	8,21E-02	1,07E-03	2,69E-03	2,03E-02	7,37E-02	6,21E-05	5,68E-06	2,60E-04	-1,26E-02
Eutrophication, marine	kg N eq	2,49E-01	8,29E-03	1,15E-02	6,94E-02	4,58E-02	4,82E-04	6,86E-05	2,64E-03	-1,88E-02
Eutrophication, terrestrial	mol N eq	3,16E+00	8,43E-02	1,24E-01	1,11E+00	3,39E-01	4,90E-03	7,88E-04	2,83E-02	-2,04E-01
Photochemical ozone formation	kg NMVOC eq	8,13E-01	5,10E-02	3,63E-02	2,29E-01	9,96E-02	2,97E-03	1,58E-04	9,57E-03	-8,38E-02
Resource use, minerals and metals*	kg Sb eq	2,85E-03	4,92E-05	1,51E-05	8,98E-04	3,06E-04	2,86E-06	1,96E-07	2,02E-06	-1,05E-03
Resource use, fossils*	MJ	2,90E+03	2,14E+02	8,28E+01	7,99E+02	7,61E+02	1,24E+01	1,87E-01	2,15E+01	-1,68E+02
Water use*	m^3 depriv.	4,55E+01	8,81E-01	2,77E+00	2,10E+01	8,08E+00	5,12E-02	9,87E-03	9,11E-01	-4,41E-02

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Table 26: Additional environmental impact indicators - SEDM-L, 600x2030 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Particulate matter	disease inc.	9,86E-06	1,12E-06	9,02E-07	3,42E-06	5,09E-07	6,51E-08	2,12E-09	1,52E-07	-1,43E-06
Human toxicity, non-cancer*	CTUh	3,74E-06	1,52E-07	8,37E-08	5,89E-07	5,33E-07	8,81E-09	4,61E-09	6,22E-09	-1,25E-06
Human toxicity, cancer*	CTUh	2,58E-07	6,86E-09	3,37E-09	1,73E-07	1,56E-08	3,98E-10	4,82E-11	5,55E-10	-1,28E-07
Land use*	Pt	1,89E+03	1,29E+02	6,78E+01	1,63E+02	7,89E+01	7,50E+00	4,15E-01	4,92E+01	-7,34E+01
Ionising radiation**	kBq U-235 eq	1,95E+01	2,89E-01	6,16E-01	5,37E+00	1,97E+01	1,68E-02	7,71E-04	2,84E-02	-5,99E-01
Ecotoxicity, freshwater	CTUe	1,88E+03	1,06E+02	2,69E+01	2,49E+02	1,67E+02	6,14E+00	2,92E+00	9,43E+00	-1,82E+02

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** Disclaimer: This impact category deals mainly with the eventual impact of low dose ionising radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionising radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Table 27: Parameters describing resource use - SEDM-L, 600x2030 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Use of renewable primary energy excl. raw materials	MJ, net calorific value	3,27E+02	3,36E+00	1,80E+01	7,05E+01	5,19E+01	1,95E-01	3,56E-02	3,70E-01	-1,72E+01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	3,27E+02	3,36E+00	1,80E+01	7,05E+01	5,19E+01	1,95E-01	3,56E-02	3,70E-01	-1,72E+01
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	1,86E+03	2,27E+02	8,73E+01	8,58E+02	8,06E+02	1,32E+01	2,01E-01	2,29E+01	-1,78E+02
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	1,86E+03	2,27E+02	8,73E+01	8,58E+02	8,06E+02	1,32E+01	2,01E-01	2,29E+01	-1,78E+02
Use of secondary material	kg	0	0	0	0	0	0	0	0	0
Use of renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Use of net fresh water	m3	1,13E+00	3,27E-02	8,35E-02	3,56E-03	8,58E-01	1,45E-03	1,26E-03	2,34E-03	-2,94E-01

Table 28: Other environmental information describing waste categories - SEDM-L, 600x2030 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Hazardous waste	kg	1,06E-01	5,35E-03	1,55E-02	1,50E-01	5,74E-02	3,11E-04	5,76E-03	5,36E-04	-6,33E-03
Non-hazardous waste disposed	kg	5,90E+01	1,06E+01	9,09E-01	6,20E+00	4,64E+00	6,17E-01	1,78E-02	8,50E+01	-6,89E+00
Radioactive waste disposed/stored	kg	4,28E-03	7,02E-05	1,40E-04	1,31E-03	4,72E-03	4,08E-06	1,90E-07	6,84E-06	-1,51E-04

Table 29: Environmental information describing output flows - SEDM-L, 600x2030 mm

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0
Materials for recycling	kg	0	0	1,72E+00	0	0	9,47E+00	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	5,64E-02	0	0
Exported energy, heat	MJ	0	0	0	0	0	1,10E-01	0	0

Table 30: Core environmental impact indicators - SEDM-L, 1200x2030 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Climate change - Fossil	kg CO2 eq	5,50E+02	3,60E+01	2,47E+01	9,14E+01	5,88E+02	2,09E+00	7,74E-01	2,40E+00	-3,49E+01
Climate change - Biogenic	kg CO2 eq	-6,46E+01	3,30E-02	1,37E+00	6,69E-01	5,59E+00	1,91E-03	1,28E-07	1,53E-02	-8,48E-02
Climate change - Land use and LU change	kg CO2 eq	3,90E-01	1,78E-02	7,36E-03	1,63E-01	7,98E-01	1,03E-03	4,47E-05	1,75E-03	-2,65E-02
Climate change	kg CO2 eq	4,86E+02	3,61E+01	2,61E+01	9,23E+01	5,95E+02	2,09E+00	7,73E-01	2,42E+00	-3,50E+01
GWP-GHG	kg CO2-eq	5,19E+02	3,60E+01	2,47E+01	9,22E+01	5,89E+02	2,09E+00	7,74E-01	2,41E+00	-3,49E+01
Ozone depletion	kg CFC11 eq	3,48E-05	7,85E-07	7,47E-08	2,49E-06	4,22E-06	4,55E-08	1,07E-09	5,68E-08	-5,99E-07
Acidification	mol H+ eq	2,63E+00	7,88E-02	1,07E-01	6,25E-01	2,64E+00	4,56E-03	4,67E-04	1,71E-02	-2,87E-01
Eutrophication, freshwater*	kg P eq	1,93E-01	2,56E-03	4,65E-03	3,39E-02	9,21E-01	1,48E-04	1,43E-05	6,29E-04	-2,69E-02
Eutrophication, marine	kg N eq	5,89E-01	1,99E-02	1,99E-02	1,16E-01	5,73E-01	1,15E-03	1,68E-04	6,39E-03	-4,15E-02
Eutrophication, terrestrial	mol N eq	7,45E+00	2,02E-01	2,15E-01	1,85E+00	4,24E+00	1,17E-02	1,95E-03	6,84E-02	-4,47E-01
Photochemical ozone formation	kg NMVOC eq	1,93E+00	1,22E-01	6,28E-02	3,81E-01	1,24E+00	7,08E-03	3,88E-04	2,31E-02	-1,85E-01
Resource use, minerals and metals*	kg Sb eq	6,45E-03	1,18E-04	2,62E-05	1,49E-03	3,82E-03	6,82E-06	4,97E-07	4,87E-06	-2,13E-03
Resource use, fossils*	MJ	6,97E+03	5,12E+02	1,43E+02	1,33E+03	9,51E+03	2,97E+01	4,69E-01	5,20E+01	-3,73E+02
Water use*	m^3 depriv.	1,08E+02	2,11E+00	4,79E+00	3,50E+01	1,01E+02	1,22E-01	2,48E-02	2,20E+00	1,87E-01

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Table 31: Additional environmental impact indicators - SEDM-L, 1200x2030 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Particulate matter	disease inc.	2,28E-05	2,68E-06	1,56E-06	5,69E-06	6,35E-06	1,56E-07	5,36E-09	3,68E-07	-3,18E-06
Human toxicity, non-cancer*	CTUh	8,58E-06	3,63E-07	1,45E-07	9,80E-07	6,66E-06	2,10E-08	1,16E-08	1,50E-08	-2,58E-06
Human toxicity, cancer*	CTUh	5,98E-07	1,64E-08	5,82E-09	2,89E-07	1,95E-07	9,52E-10	1,20E-10	1,34E-09	-2,87E-07
Land use*	Pt	4,46E+03	3,09E+02	1,17E+02	2,72E+02	9,87E+02	1,79E+01	1,05E+00	1,19E+02	-1,60E+02
Ionising radiation**	kBq U-235 eq	4,66E+01	6,93E-01	1,07E+00	8,94E+00	2,46E+02	4,01E-02	1,93E-03	6,86E-02	-1,31E+00
Ecotoxicity, freshwater	CTUe	4,35E+03	2,53E+02	4,71E+01	4,15E+02	2,08E+03	1,47E+01	7,33E+00	2,28E+01	-3,84E+02

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** Disclaimer: This impact category deals mainly with the eventual impact of low dose ionising radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionising radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Table 32: Parameters describing resource use - SEDM-L, 1200x2030 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Use of renewable primary energy excl. raw materials	MJ, net calorific value	7,91E+02	8,04E+00	3,12E+01	1,17E+02	6,48E+02	4,66E-01	9,02E-02	8,93E-01	-3,79E+01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	7,91E+02	8,04E+00	3,12E+01	1,17E+02	6,48E+02	4,66E-01	9,02E-02	8,93E-01	-3,79E+01
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	4,42E+03	5,44E+02	1,51E+02	1,43E+03	1,01E+04	3,15E+01	5,02E-01	5,53E+01	-3,95E+02
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	4,42E+03	5,44E+02	1,51E+02	1,43E+03	1,01E+04	3,15E+01	5,02E-01	5,53E+01	-3,95E+02
Use of secondary material	kg	0	0	0	0	0	0	0	0	0
Use of renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0	0
Use of net fresh water	m3	2,70E+00	7,79E-02	1,99E-01	9,95E-03	2,04E+00	3,46E-03	3,00E-03	5,58E-03	-7,01E-01

Table 33: Other environmental information describing waste categories - SEDM-L, 1200x2030 mm

Impact category	Unit	A1-A3	A4	A5		B2	C2	C3	C4	D
				Mortar	Mineral wool					
Hazardous waste	kg	2,56E-01	1,28E-02	2,68E-02	2,50E-01	7,17E-01	7,43E-04	1,41E-02	1,29E-03	-1,37E-02
Non-hazardous waste disposed	kg	1,42E+02	2,54E+01	1,73E+00	1,05E+01	5,80E+01	1,47E+00	4,45E-02	2,06E+02	-1,54E+01
Radioactive waste disposed/stored	kg	1,02E-02	1,68E-04	2,42E-04	2,19E-03	5,90E-02	9,75E-06	4,78E-07	1,65E-05	-3,30E-04

Table 34: Environmental information describing output flows - SEDM-L, 1200x2030 mm

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0
Materials for recycling	kg	0	0	4,10E+00	0	0	2,16E+01	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	5,64E-02	0	0
Exported energy, heat	MJ	0	0	0	0	0	1,10E-01	0	0

Table 35: Information describing the biogenic carbon content - SEDM

Biogenic carbon content per 1 pc of SEDM	Unit	Biogenic C content
Biogenic carbon content in product (all types and sizes)	kg C	0
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), 180x180 mm	kg C	3,36E-01
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), 800x500 mm	kg C	9,37E-01
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), 1600x1000 mm	kg C	2,29E+00
NOTE: 1 kg biogenic carbon is equivalent to 44/12 kg of CO_2		

Table 36: Information describing the biogenic carbon content - SEDM-L

Biogenic carbon content per 1 pc of SEDM-L	Unit	Biogenic C content
Biogenic carbon content in product (all types and sizes)	kg C	0
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), 200x430 mm	kg C	3,59E-01
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), 600x1030 mm	kg C	9,31E-01
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), 1200x2030 mm	kg C	2,22E+00
NOTE: 1 kg biogenic carbon is equivalent to 44/12 kg of CO_2		

ADDITIONAL ENVIRONMENTAL INFORMATION

EMS

The company has established, maintain and have certified the environmental management system according to EN ISO 14001.


CERTIFICATE

MANDÍK, a.s.

ISO 14001:2015

Packaging waste

The take-back and use of packaging waste that the company has put on the market in the Czech Republic is ensured through the authorized packaging company EKO-KOM, a.s. according to Act No. 447/2001 Sb., on packaging, as amended.

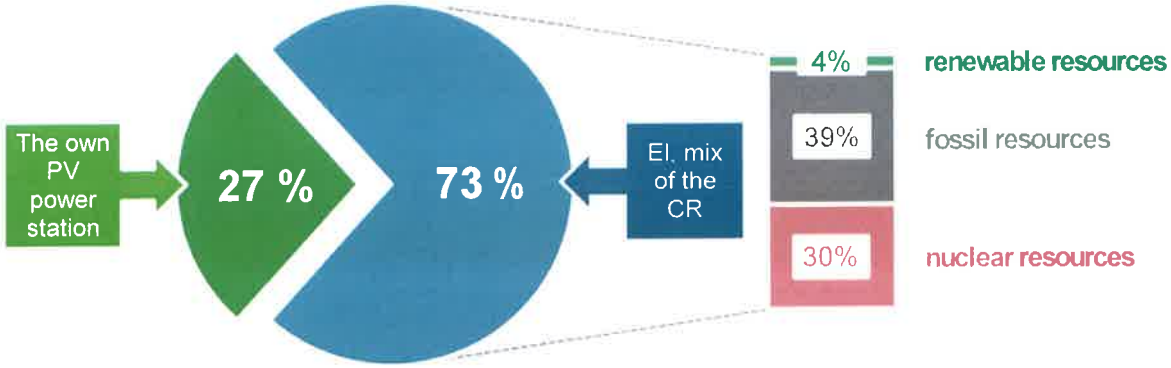
Waste of electrical equipment

The company fulfills the obligations set for manufacturers of electrical equipment for the separate collection, take-back, processing, use and disposal of electrical equipment and electrical waste through the ASEKOL a.s. collective system in the Czech Republic according to Act No. 542/2020 Sb., on end-of-life products, as amended.

Further information about the validity of certification is on the company's website.

Electricity production

The graph shows the considered energy mix of the company. More than a quater of the electricity comes from renewable resource - from the own photovoltaic power station.



Energy Source and Emission Level for Electricity: Czech residual mix, contains: 53,6 % of fossil fuels, 41 % of nuclear, 5,4 % of renewable sources was used for modelling of electricity an A3 phase.
GWP-GHG from the production of electricity for the Czech residual mix: 0,707 kg CO_2 eq/kWh,
for the company's mix: 0,516 kg CO_2 eq/kWh.

REFERENCES

ISO 14025:2006, Environmental labels and declarations - Type III environmental declarations — Principles and procedures

EN ISO 14040:2006, Environmental management - Life cycle assessment — Principles and framework

ISO 14044:2006-10, Environmental management - Life Cycle Assessment — Requirements and guidelines

EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the construction products product category

Národní program environmentálního značení (NPEZ), Cenia (2017)

/Ecoinvent / Ecoinvent Centre, www.ecoinvent.org

/SimaPro/ SimaPro LCA Software, Pré Consultants, the Netherlands, www.pre-sustainability.com

Adress:

MANDÍK, a.s.
Dobřišská 550
267 24 Hostomice
Czech Republic

Contacts:

tel.: +420 311 706 706
e-mail: mandik@mandik.cz

www.mandik.com

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