

EPD Environmental product declaration

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

CONSTANT AIRFLOW REGULATORS

RPM-K
RPMC-K



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MANDÍK®

GENERAL INFORMATION

Programme	National Environmental Labelling Program (NPEZ)
Programme operator	MŽP, Ministry of the Environment of the Czech Republic
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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: <input type="checkbox"/> internal <input checked="" type="checkbox"/> 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

<p>Manufacturing company (the headquarters and the production site)</p>	<p>MANDÍK. a.s. Dobříšská 550, Hostomice 267 24 Czech Republic Registration N°: 26718405 VAT N°: CZ26718405</p>
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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.

PRODUCT INFORMATION

Air flow regulators with constant flow are designed for regulating of air supply or air exhaust in ventilation systems. They can be installed in a horizontal, vertical or inclined positions. To ensure proper operation, the regulator must be installed with horizontal position of its blade's axis. The aerodynamic forces acting on the regulator blade due to the flow are balanced by the control device, which is set according to the required flow. Adjustment of required flow is simply performed by lever with a pointer and scale. Mechanical controllers need not be connected to any external power source. The controller consists of the casing of the controller with a control blade and control device. Control device is placed inside of box with scale for adjustment of required flow. Accuracy of the scale is $\pm 5\%$. Regulators can be alternatively equipped by actuating mechanism. It enable remote adjustment of required flow.

RPM-K

TPM 094/13

Constant airflow regulator - round

- › For keeping and regulation of constant airflow volume in HVAC systems
- › Dimensions from DN 80 up to DN 400 mm
- › Airflow volume from 50 up to 4 500 m³/h
- › Set the desired flow rate manually or by actuator
- › Material: casing and actuating mechanism made of galvanized steel, leaf made of aluminium, leaf axe, bearings and spring made of austenitic steel



- › Design:
 - Manually controlled**
 - Actuating mechanism**
 - Open-close control
 - Open-close control, with limit switch
 - With modulating control

RPMC-K

TPM 105/14

Constant airflow regulator - square

- › For keeping and regulation of constant airflow volume in HVAC systems
- › Dimensions from 200 × 100 up to 600 × 600 mm
- › Airflow volume from 250 up to 12 000 m³/h
- › Set the desired flow rate manually or by actuator
- › Material: casing and actuating mechanism made of galvanized steel, leaf made of aluminium, leaf axe, bearings and spring made of austenitic steel



- › Design:
 - Manually controlled**
 - Actuating mechanism**
 - Open-close control
 - Open-close control, with limit switch
 - With modulating control

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 – RPM-K manual

RPM-K manual								
Dimension (mm)	Ø 80		Ø 200		Ø 400		Post-consumer recycled material, weight-%*	Biogenic material, weight-% and kg C/ DU
Weight (kg/DU)	2.09		3.76		6.56			
	kg	%	kg	%	kg	%		
Steel	2.03E+00	97.04%	3.58E+00	95.17%	5.88E+00	88.33%	0	0
Plastics and rubber	2.67E-02	1.28%	5.83E-02	1.55%	9.85E-02	1.48%	0	0
Others (graphite, etc.)	3.51E-02	1.68%	1.23E-01	3.28%	5.88E-01	8.84%	0	0

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

Table 2: Material content of packaging – RPM-K manual

RPM-K manual									
Dimension (mm)	Ø 80			Ø 200			Ø 400		
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	3.42E-02	1.64%	1.53E-02	6.15E-02	1.64%	2.75E-02	1.07E-01	1.64%	4.78E-02
PE	1.12E-02	0.54%	0	2.01E-02	0.54%	0	3.52E-02	0.54%	0
PVC	6.36E-03	0.30%	0	1.14E-02	0.30%	0	2.00E-02	0.30%	0
PP	1.53E-04	0.01%	0	2.76E-04	0.01%	0	4.82E-04	0.01%	0
Steel	1.20E-04	0.01%	0	2.17E-04	0.01%	0	3.78E-04	0.01%	0
Wood	1.18E-02	13.56%	5.27E-03	2.12E-02	13.56%	9.46E-03	3.71E-02	13.56%	1.66E-02
Total	6.38E-02	16.05%	2.05E-02	1.15E-01	16.05%	3.69E-02	2.01E-01	16.05%	6.43E-02

Table 3: Material content of the product – RPM-K with the actuator

RPM-K with the actuator								
Dimension (mm)	Ø 80		Ø 200		Ø 400		Post-consumer recycled material, weight-%*	Biogenic material, weight-% and kg C/ DU
Weight (kg/DU)	2.09		3.76		6.56			
	kg	%	kg	%	kg	%		
Steel	2.11E+00	79.90%	3.62E+00	84.13%	5.96E+00	80.81%	2.11E+00	79.90%
Plastics and rubber	2.67E-02	1.01%	5.98E-02	1.39%	9.85E-02	1.33%	2.67E-02	1.01%
Electronics	4.70E-01	17.77%	4.70E-01	10.93%	7.30E-01	9.89%	4.70E-01	17.77%
Others	3.51E-02	1.33%	1.52E-01	3.55%	5.88E-01	7.96%	3.51E-02	1.33%

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

Table 4: Material content of packaging – RPM-K with the actuator

RPM-K with the actuator									
Dimension (mm)	Ø 80			Ø 200			Ø 400		
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	4.33E-02	1.64%	1.93E-02	7.04E-02	1.64%	3.14E-02	1.21E-01	1.64%	5.40E-02
PE	1.42E-02	0.54%	0	2.31E-02	0.54%	0	3.96E-02	0.54%	0
PVC	8.06E-03	0.30%	0	1.31E-02	0.30%	0	2.25E-02	0.30%	0
PP	1.94E-04	0.01%	0	3.16E-04	0.01%	0	5.42E-04	0.01%	0
Steel	1.52E-04	0.01%	0	2.48E-04	0.01%	0	4.25E-04	0.01%	0
Wood	1.50E-02	13.56%	6.70E-03	2.43E-02	13.56%	1.08E-02	4.17E-02	13.56%	1.86E-02
Total	8.08E-02	16.05%	2.60E-02	1.31E-01	16.05%	4.23E-02	2.26E-01	16.05%	7.26E-02

Table 5: Material content of the product – RPMC-K manual

RPCM-K manual								
Dimension (mm)	200x100		300x300		600x600		Post-consumer recycled material, weight-%*	Biogenic material, weight-% and kg C/DU
Weight (kg/DU)	4.19		6.68		19.34			
	kg	%	kg	%	kg	%		
Steel	4.10E+00	97.87%	6.26E+00	93.78%	1.61E+01	83.31%	0	0
Aluminium	8.59E-02	2.05%	4.09E-01	6.13%	3.21E+00	16.59%	0	0
Plastics and rubber	3.48E-03	0.08%	5.91E-03	0.09%	1.96E-02	0.10%	0	0

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

Table 6: Material content of packaging – RPMC-K manual

RPCM-K manual									
Dimension (mm)	200x100			300x300			600x600		
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	6.86E-02	1.64%	3.06E-02	1.09E-01	1.64%	4.87E-02	3.17E-01	1.64%	1.42E-01
PE	2.25E-02	0.54%	0	3.58E-02	0.54%	0	1.04E-01	0.54%	0
PVC	1.28E-02	0.30%	0	2.03E-02	0.30%	0	5.89E-02	0.30%	0
PP	3.08E-04	0.01%	0	4.90E-04	0.01%	0	1.42E-03	0.01%	0
Steel	2.42E-04	0.01%	0	3.85E-04	0.01%	0	1.11E-03	0.01%	0
Wood	2.37E-02	13.56%	1.06E-02	3.77E-02	13.56%	1.68E-02	1.09E-01	13.56%	4.87E-02
Total	1.28E-01	16.05%	4.12E-02	2.04E-01	16.05%	6.55E-02	5.91E-01	16.05%	1.90E-01

Table 7: Material content of the product – RPMC-K with the actuator

RPCM-K s pohonem								
Dimension (mm)	200x100		300x300		600x600		Post-consumer recycled material, weight-%*	Biogenic material, weight-% and kg C/DU
Weight (kg/DU)	4.72		7.49		21.49			
	kg	%	kg	%	kg	%		
Steel	4.17E+00	88.19%	6.34E+00	84.71%	1.64E+01	76.14%	0	0
Aluminium	8.59E-02	1.82%	4.09E-01	5.46%	3.21E+00	14.93%	0	0
Electronics	4.70E-01	9.94%	7.30E-01	9.75%	1.90E+00	8.84%		
Plastics and rubber	2.48E-03	0.05%	5.91E-03	0.08%	1.96E-02	0.09%	0	0

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

Table 8: Material content of packaging – RPMC-K with the actuator

RPCM-K s pohonem									
Dimension (mm)	200x100			300x300			600x600		
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	7.74E-02	1.64%	3.46E-02	1.23E-01	1.64%	5.49E-02	3.52E-01	1.64%	1.57E-01
PE	2.53E-02	0.54%	0	4.02E-02	0.54%	0	1.15E-01	0.54%	0
PVC	1.44E-02	0.30%	0	2.28E-02	0.30%	0	6.54E-02	0.30%	0
PP	3.47E-04	0.01%	0	5.50E-04	0.01%	0	1.58E-03	0.01%	0
Steel	2.72E-04	0.01%	0	4.32E-04	0.01%	0	1.24E-03	0.01%	0
Wood	2.67E-02	13.56%	1.19E-02	4.23E-02	13.56%	1.89E-02	1.21E-01	13.56%	5.40E-02
Total	1.44E-01	16.05%	4.65E-02	2.29E-01	16.05%	7.38E-02	6.57E-01	16.05%	2.11E-01

LCA INFORMATION

Declared unit:	1 pc of constant airflow regulator of a specific type
Reference service life:	20 years (used for calculation of energy consumption in the use phase)
Geografical 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 (constant airflow regulators) 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 type of control - manual or by actuating mechanism.

Production stage (A1-A3)

The A1 module contains primarily the production of components for the assembly of complete constant airflow regulators. These are profiles and components made of steel, aluminium, 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, 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 (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, consumption 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 airflow regulators to building is considered as manual (in ventilation ducts) without any ancillary materials for installation. 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. There are no direct emissions to ambient air, soil and water.

Use stage (B1-B7)

In the use phase, the operating electrical energy consumption of the actuator 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, 5 % of the adjustment time of the regulator blade and the remaining time in stand-by mode is 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.

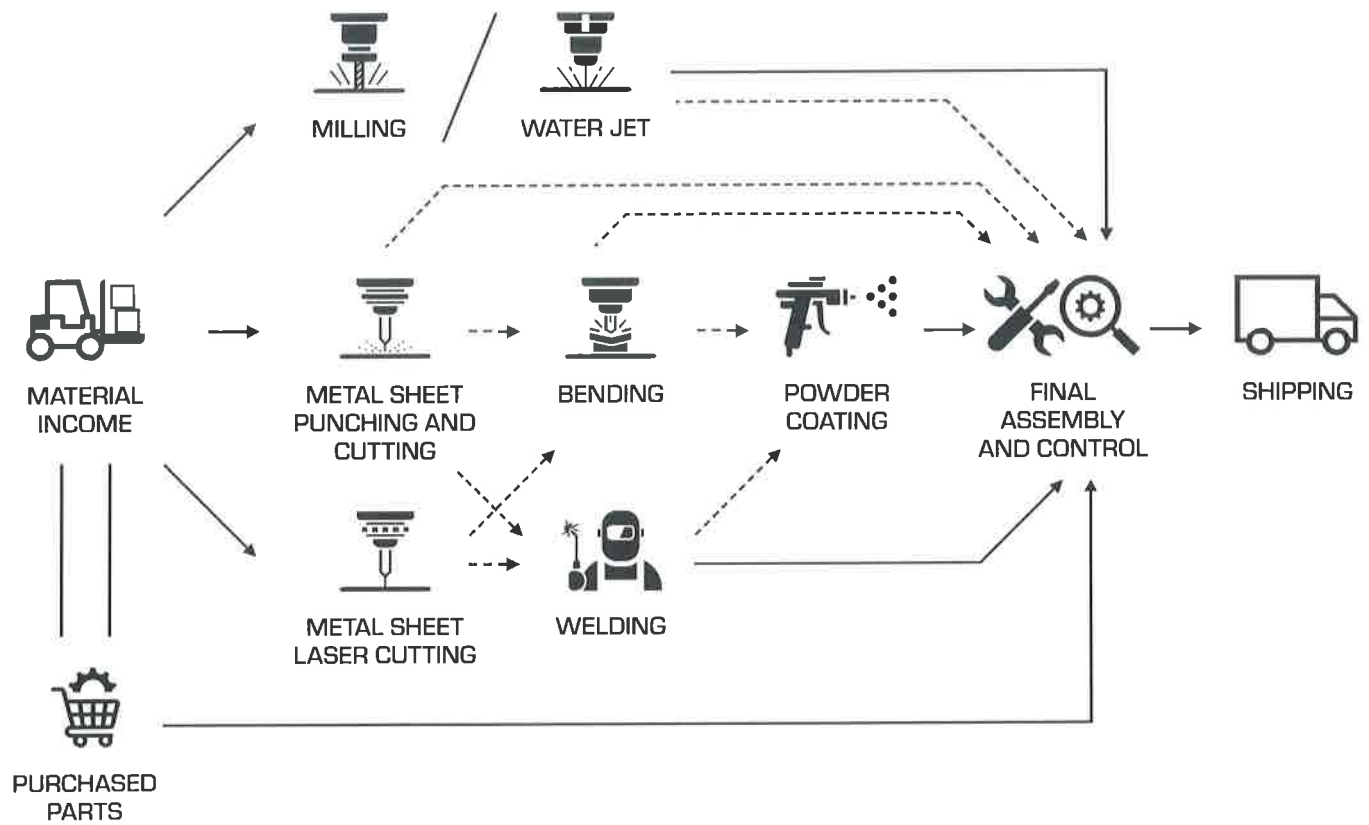
In the C3 module, the recycling of metal and electronic components (70 %), the energy use of plastics (1 %) and the landfilling of the remaining materials (29 %) are calculated.

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	
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 9: Core environmental impact indicators - RPM-K, DN 80 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Climate change - Fossil	kg CO2 eq	7,31E+00	2,64E-01	5,29E-04	0	1,92E-02	2,54E-02	1,87E-04	-3,91E+00
Climate change - Biogenic	kg CO2 eq	4,71E-02	2,42E-04	4,75E-03	0	1,76E-05	3,46E-06	1,19E-06	-8,86E-03
Climate change - Land use and LU change	kg CO2 eq	1,23E-02	1,30E-04	6,20E-08	0	9,49E-06	1,27E-07	1,36E-07	-7,86E-03
Climate change	kg CO2 eq	7,37E+00	2,65E-01	5,27E-03	0	1,92E-02	2,54E-02	1,89E-04	-3,93E+00
GWP-GHG	kg CO2 eq	7,35E+00	2,64E-01	1,49E-03	0	1,92E-02	2,54E-02	1,88E-04	-3,92E+00
Ozone depletion	kg CFC11 eq	1,65E-07	5,75E-09	4,38E-12	0	4,18E-10	2,84E-11	4,43E-12	-7,01E-08
Acidification	mol H+ eq	7,91E-02	5,78E-04	1,60E-06	0	4,20E-05	5,51E-06	1,33E-06	-1,85E-02
Eutrophication, freshwater*	kg P eq	3,93E-03	1,88E-05	8,15E-08	0	1,37E-06	5,50E-08	4,91E-08	-1,90E-03
Eutrophication, marine	kg N eq	9,68E-03	1,46E-04	5,04E-06	0	1,06E-05	3,24E-06	4,99E-07	-4,04E-03
Eutrophication, terrestrial	mol N eq	2,84E-01	1,48E-03	7,70E-06	0	1,08E-04	2,75E-05	5,34E-06	-4,10E-02
Photochemical ozone formation	kg NMVOC eq	3,35E-02	8,97E-04	3,01E-06	0	6,52E-05	6,88E-06	1,81E-06	-1,83E-02
Resource use, minerals and metals*	kg Sb eq	1,84E-04	8,64E-07	4,11E-10	0	6,28E-08	9,43E-10	3,80E-10	-2,63E-05
Resource use, fossils*	MJ	9,11E+01	3,75E+00	3,07E-03	0	2,73E-01	3,72E-03	4,06E-03	-4,21E+01
Water use*	m³ depriv.	4,82E-01	1,55E-02	-1,72E-05	0	1,13E-03	1,34E-04	1,72E-04	1,86E-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 10: Additional environmental impact indicators - RPM-K, DN 80 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Particulate matter	disease inc.	9,89E-07	1,97E-08	3,52E-11	0	1,43E-09	2,45E-11	2,87E-11	-3,37E-07
Human toxicity, non-cancer*	CTUh	1,68E-07	2,66E-09	1,16E-11	0	1,94E-10	6,03E-11	1,17E-12	-8,96E-08
Human toxicity, cancer*	CTUh	3,87E-08	1,20E-10	1,72E-12	0	8,76E-12	1,43E-12	1,05E-13	-2,98E-08
Land use*	Pt	2,51E+01	2,27E+00	5,72E-03	0	1,65E-01	1,04E-03	9,27E-03	-1,29E+01
Ionising radiation**	kBq U-235 eq	6,39E-01	5,08E-03	5,10E-06	0	3,69E-04	1,29E-05	5,35E-06	-1,58E-01
Ecotoxicity, freshwater	CTUe	7,97E+01	1,86E+00	2,13E-02	0	1,35E-01	5,40E-02	1,78E-03	-2,13E+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 11: Parameters describing resource use - RPM-K, DN 80 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Use of renewable primary energy excl. raw materials	MJ, net calorific value	8,48E+00	5,90E-02	7,96E-05	0	4,29E-03	2,18E-04	6,97E-05	-4,82E+00
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	8,48E+00	5,90E-02	7,96E-05	0	4,29E-03	2,18E-04	6,97E-05	-4,82E+00
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	9,71E+01	3,99E+00	3,27E-03	0	2,90E-01	4,04E-03	4,32E-03	-4,46E+01
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	9,71E+01	3,99E+00	3,27E-03	0	2,90E-01	4,04E-03	4,32E-03	-4,46E+01
Use of secondary material	kg	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
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of net fresh water	m3	2,48E-02	7,18E-04	1,83E-03	0	3,19E-05	2,76E-05	5,14E-05	-6,46E-03

Table 12: Other environmental information describing waste categories - RPM-K, DN 80 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Hazardous waste	kg	6,24E-03	9,40E-05	1,54E-05	0	6,83E-06	2,85E-04	1,01E-07	-1,11E-03
Non-hazardous waste disposed	kg	2,92E+00	1,86E-01	5,38E-03	0	1,36E-02	3,49E-04	1,60E-02	-1,69E+00
Radioactive waste disposed/stored	kg	1,58E-04	1,23E-06	1,19E-09	0	8,97E-08	3,20E-09	1,29E-09	-3,97E-05

Table 13: Environmental information describing output flows - RPM-K, DN 80 mm, manual

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	3,79E-02	0	0	2,06E+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	4,18E-02	0	0
Exported energy, heat	MJ	0	0	0	0	0	8,17E-02	0	0

Table 14: Core environmental impact indicators - RPM-K, DN 80 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Climate change - Fossil	kg CO2 eq	1,01E+01	3,36E-01	6,69E-04	5,29E+01	2,44E-02	1,50E-01	1,87E-04	-4,09E+00
Climate change - Biogenic	kg CO2 eq	5,62E-02	3,08E-04	6,00E-03	5,03E-01	2,23E-05	3,46E-06	1,19E-06	-9,22E-03
Climate change - Land use and LU change	kg CO2 eq	1,67E-02	1,66E-04	7,84E-08	7,18E-02	1,20E-05	7,60E-06	1,36E-07	-8,01E-03
Climate change	kg CO2 eq	1,02E+01	3,37E-01	6,67E-03	5,35E+01	2,44E-02	1,49E-01	1,89E-04	-4,11E+00
GWP-GHG	kg CO2 eq	1,02E+01	3,36E-01	1,89E-03	5,30E+01	2,44E-02	1,50E-01	1,88E-04	-4,09E+00
Ozone depletion	kg CFC11 eq	2,11E-07	7,32E-09	5,54E-12	3,80E-07	5,31E-10	2,02E-10	4,43E-12	-7,31E-08
Acidification	mol H+ eq	1,18E-01	7,35E-04	2,03E-06	2,37E-01	5,33E-05	8,26E-05	1,33E-06	-1,94E-02
Eutrophication, freshwater*	kg P eq	7,02E-03	2,39E-05	1,03E-07	8,29E-02	1,73E-06	2,45E-06	4,91E-08	-1,98E-03
Eutrophication, marine	kg N eq	1,37E-02	1,85E-04	6,38E-06	5,15E-02	1,35E-05	3,07E-05	4,99E-07	-4,25E-03
Eutrophication, terrestrial	mol N eq	3,36E-01	1,88E-03	9,75E-06	3,81E-01	1,37E-04	3,48E-04	5,34E-06	-4,31E-02
Photochemical ozone formation	kg NMVOC eq	4,89E-02	1,14E-03	3,81E-06	1,12E-01	8,28E-05	7,04E-05	1,81E-06	-1,92E-02
Resource use, minerals and metals*	kg Sb eq	5,17E-04	1,10E-06	5,20E-10	3,44E-04	7,97E-08	8,42E-08	3,80E-10	-2,75E-05
Resource use, fossils*	MJ	1,24E+02	4,78E+00	3,88E-03	8,55E+02	3,46E-01	8,16E-02	4,06E-03	-4,40E+01
Water use*	m ³ depriv.	1,22E+00	1,97E-02	-2,18E-05	9,08E+00	1,43E-03	4,27E-03	1,72E-04	1,96E-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 15: Additional environmental impact indicators - RPM-K, DN 80 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Particulate matter	disease inc.	1,25E-06	2,51E-08	4,45E-11	5,72E-07	1,82E-09	9,18E-10	2,87E-11	-3,52E-07
Human toxicity, non-cancer*	CTUh	5,38E-07	3,39E-09	1,46E-11	5,99E-07	2,46E-10	2,00E-09	1,17E-12	-9,33E-08
Human toxicity, cancer*	CTUh	5,17E-08	1,53E-10	2,18E-12	1,76E-08	1,11E-11	2,12E-11	1,05E-13	-3,11E-08
Land use*	Pt	3,99E+01	2,89E+00	7,24E-03	8,87E+01	2,09E-01	1,78E-01	9,27E-03	-1,36E+01
Ionising radiation**	kBq U-235 eq	8,45E-01	6,46E-03	6,46E-06	2,21E+01	4,69E-04	3,35E-04	5,35E-06	-1,63E-01
Ecotoxicity, freshwater	CTUe	1,20E+02	2,36E+00	2,70E-02	1,87E+02	1,71E-01	1,27E+00	1,78E-03	-2,24E+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 16: Parameters describing resource use - RPM-K, DN 80 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Use of renewable primary energy excl. raw materials	MJ, net calorific value	1,20E+01	7,51E-02	1,01E-04	5,83E+01	5,44E-03	1,53E-02	6,97E-05	-4,98E+00
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	1,20E+01	7,51E-02	1,01E-04	5,83E+01	5,44E-03	1,53E-02	6,97E-05	-4,98E+00
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	1,32E+02	5,08E+00	4,14E-03	9,06E+02	3,68E-01	8,75E-02	4,32E-03	-4,66E+01
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	1,32E+02	5,08E+00	4,14E-03	9,06E+02	3,68E-01	8,75E-02	4,32E-03	-4,66E+01
Use of secondary material	kg	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
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of net fresh water	m3	3,16E-02	9,12E-04	2,33E-03	2,39E-02	4,05E-05	3,51E-05	6,53E-05	-8,20E-03

Table 17: Other environmental information describing waste categories - RPM-K, DN 80 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Hazardous waste	kg	1,22E-02	1,20E-04	1,94E-05	6,45E-02	8,67E-06	2,58E-03	1,01E-07	-1,17E-03
Non-hazardous waste disposed	kg	3,85E+00	2,37E-01	6,82E-03	5,22E+00	1,72E-02	7,73E-03	1,60E-02	-1,77E+00
Radioactive waste disposed/stored	kg	2,09E-04	1,57E-06	1,51E-09	5,31E-03	1,14E-07	8,27E-08	1,29E-09	-4,10E-05

Table 18: Environmental information describing output flows - RPM-K, DN 80 mm, with the actuator

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	4,80E-02	0	0	2,62E+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	4,18E-02	0	0
Exported energy, heat	MJ	0	0	0	0	0	8,17E-02	0	0

Table 19: Core environmental impact indicators - RPM-K, DN 200 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Climate change - Fossil	kg CO2 eq	1,36E+01	4,77E-01	9,51E-04	0	3,47E-02	4,34E-02	4,69E-04	-7,46E+00
Climate change - Biogenic	kg CO2 eq	8,64E-02	4,37E-04	8,52E-03	0	3,18E-05	5,92E-06	2,98E-06	-1,76E-02
Climate change - Land use and LU change	kg CO2 eq	3,24E-02	2,35E-04	1,11E-07	0	1,71E-05	2,16E-07	3,41E-07	-2,34E-02
Climate change	kg CO2 eq	1,37E+01	4,77E-01	9,47E-03	0	3,48E-02	4,34E-02	4,72E-04	-7,50E+00
GWP-GHG	kg CO2 eq	1,37E+01	4,77E-01	2,68E-03	0	3,47E-02	4,34E-02	4,70E-04	-7,47E+00
Ozone depletion	kg CFC11 eq	3,08E-07	1,04E-08	7,87E-12	0	7,56E-10	4,85E-11	1,11E-11	-1,36E-07
Acidification	mol H+ eq	1,45E-01	1,04E-03	2,88E-06	0	7,59E-05	9,42E-06	3,33E-06	-3,67E-02
Eutrophication, freshwater*	kg P eq	7,26E-03	3,39E-05	1,46E-07	0	2,47E-06	9,40E-08	1,23E-07	-3,60E-03
Eutrophication, marine	kg N eq	1,79E-02	2,63E-04	9,06E-06	0	1,92E-05	5,54E-06	1,25E-06	-7,69E-03
Eutrophication, terrestrial	mol N eq	5,11E-01	2,67E-03	1,38E-05	0	1,95E-04	4,70E-05	1,33E-05	-7,78E-02
Photochemical ozone formation	kg NMVOC eq	6,18E-02	1,62E-03	5,41E-06	0	1,18E-04	1,18E-05	4,51E-06	-3,44E-02
Resource use, minerals and metals*	kg Sb eq	3,29E-04	1,56E-06	7,38E-10	0	1,14E-07	1,61E-09	9,51E-10	-4,72E-05
Resource use, fossils*	MJ	1,70E+02	6,77E+00	5,51E-03	0	4,93E-01	6,37E-03	1,01E-02	-8,12E+01
Water use*	m ³ depriv.	1,03E+00	2,79E-02	-3,09E-05	0	2,03E-03	2,30E-04	4,30E-04	1,99E-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 20: Additional environmental impact indicators - RPM-K, DN 200 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Particulate matter	disease inc.	1,81E-06	3,55E-08	6,32E-11	0	2,59E-09	4,20E-11	7,19E-11	-6,37E-07
Human toxicity, non-cancer*	CTUh	3,15E-07	4,80E-09	2,08E-11	0	3,50E-10	1,03E-10	2,93E-12	-1,73E-07
Human toxicity, cancer*	CTUh	6,98E-08	2,17E-10	3,09E-12	0	1,58E-11	2,44E-12	2,62E-13	-5,41E-08
Land use*	Pt	4,54E+01	4,09E+00	1,03E-02	0	2,98E-01	1,77E-03	2,32E-02	-2,33E+01
Ionising radiation**	kBq U-235 eq	1,22E+00	9,16E-03	9,17E-06	0	6,68E-04	2,20E-05	1,34E-05	-3,45E-01
Ecotoxicity, freshwater	CTUe	1,43E+02	3,35E+00	3,83E-02	0	2,44E-01	9,23E-02	4,45E-03	-3,95E+01

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Table 21: Parameters describing resource use - RPM-K, DN 200 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Use of renewable primary energy excl. raw materials	MJ, net calorific value	1,78E+01	1,06E-01	1,43E-04	0	7,75E-03	3,72E-04	1,74E-04	-1,09E+01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	1,78E+01	1,06E-01	1,43E-04	0	7,75E-03	3,72E-04	1,74E-04	-1,09E+01
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	1,82E+02	7,20E+00	5,87E-03	0	5,24E-01	6,91E-03	1,08E-02	-8,61E+01
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	1,82E+02	7,20E+00	5,87E-03	0	5,24E-01	6,91E-03	1,08E-02	-8,61E+01
Use of secondary material	kg	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
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of net fresh water	m3	4,48E-02	1,29E-03	3,30E-03	0	5,74E-05	4,97E-05	9,26E-05	-1,16E-02

Table 22: Other environmental information describing waste categories - RPM-K, DN 200 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Hazardous waste	kg	1,13E-02	1,70E-04	2,76E-05	0	1,24E-05	4,88E-04	2,53E-07	-2,13E-03
Non-hazardous waste disposed	kg	5,37E+00	3,36E-01	9,68E-03	0	2,45E-02	5,96E-04	4,01E-02	-3,13E+00
Radioactive waste disposed/stored	kg	3,01E-04	2,23E-06	2,14E-09	0	1,62E-07	5,47E-09	3,23E-09	-8,71E-05

Table 23: Environmental information describing output flows - RPM-K, DN 200 mm, manual

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	6,82E-02	0	0	3,70E+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	7,15E-02	0	0
Exported energy, heat	MJ	0	0	0	0	0	1,40E-01	0	0

Table 24: Core environmental impact indicators - RPM-K, DN 200 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Climate change - Fossil	kg CO2 eq	1,66E+01	5,45E-01	1,09E-03	5,29E+01	3,97E-02	1,71E-01	4,69E-04	-7,81E+00
Climate change - Biogenic	kg CO2 eq	9,59E-02	4,99E-04	9,78E-03	5,03E-01	3,64E-05	5,92E-06	2,98E-06	-1,87E-02
Climate change - Land use and LU change	kg CO2 eq	4,18E-02	2,69E-04	1,28E-07	7,18E-02	1,96E-05	7,70E-06	3,41E-07	-2,80E-02
Climate change	kg CO2 eq	1,68E+01	5,46E-01	1,09E-02	5,35E+01	3,98E-02	1,71E-01	4,72E-04	-7,85E+00
GWP-GHG	kg CO2 eq	1,67E+01	5,45E-01	3,08E-03	5,30E+01	3,97E-02	1,71E-01	4,70E-04	-7,82E+00
Ozone depletion	kg CFC11 eq	3,55E-07	1,19E-08	9,03E-12	3,80E-07	8,65E-10	2,26E-10	1,11E-11	-1,43E-07
Acidification	mol H+ eq	1,85E-01	1,19E-03	3,31E-06	2,37E-01	8,68E-05	8,73E-05	3,33E-06	-3,90E-02
Eutrophication, freshwater*	kg P eq	1,04E-02	3,87E-05	1,68E-07	8,29E-02	2,82E-06	2,50E-06	1,23E-07	-3,75E-03
Eutrophication, marine	kg N eq	2,20E-02	3,01E-04	1,04E-05	5,15E-02	2,19E-05	3,34E-05	1,25E-06	-8,07E-03
Eutrophication, terrestrial	mol N eq	5,62E-01	3,05E-03	1,59E-05	3,81E-01	2,23E-04	3,72E-04	1,33E-05	-8,16E-02
Photochemical ozone formation	kg NMVOC eq	7,79E-02	1,85E-03	6,21E-06	1,12E-01	1,35E-04	7,63E-05	4,51E-06	-3,59E-02
Resource use, minerals and metals*	kg Sb eq	6,59E-04	1,78E-06	8,47E-10	3,44E-04	1,30E-07	8,50E-08	9,51E-10	-4,81E-05
Resource use, fossils*	MJ	2,06E+02	7,74E+00	6,33E-03	8,55E+02	5,64E-01	8,48E-02	1,01E-02	-8,55E+01
Water use*	m ³ depriv.	1,86E+00	3,19E-02	-3,54E-05	9,08E+00	2,33E-03	4,39E-03	4,30E-04	1,42E-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 25: Additional environmental impact indicators - RPM-K, DN 200 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Particulate matter	disease inc.	2,08E-06	4,06E-08	7,25E-11	5,72E-07	2,96E-09	9,39E-10	7,19E-11	-6,65E-07
Human toxicity, non-cancer*	CTUh	6,90E-07	5,49E-09	2,39E-11	5,99E-07	4,00E-10	2,05E-09	2,93E-12	-1,81E-07
Human toxicity, cancer*	CTUh	8,28E-08	2,48E-10	3,54E-12	1,76E-08	1,81E-11	2,24E-11	2,62E-13	-5,54E-08
Land use*	Pt	6,02E+01	4,68E+00	1,18E-02	8,87E+01	3,41E-01	1,79E-01	2,32E-02	-2,41E+01
Ionising radiation**	kBq U-235 eq	1,45E+00	1,05E-02	1,05E-05	2,21E+01	7,64E-04	3,46E-04	1,34E-05	-3,79E-01
Ecotoxicity, freshwater	CTUe	1,86E+02	3,83E+00	4,39E-02	1,87E+02	2,79E-01	1,32E+00	4,45E-03	-4,10E+01

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Table 26: Parameters describing resource use - RPM-K, DN 200 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Use of renewable primary energy excl. raw materials	MJ, net calorific value	2,24E+01	1,22E-01	1,64E-04	5,83E+01	8,87E-03	1,55E-02	1,74E-04	-1,21E+01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	2,24E+01	1,22E-01	1,64E-04	5,83E+01	8,87E-03	1,55E-02	1,74E-04	-1,21E+01
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	2,19E+02	8,23E+00	6,74E-03	9,06E+02	6,00E-01	9,09E-02	1,08E-02	-9,06E+01
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	2,19E+02	8,23E+00	6,74E-03	9,06E+02	6,00E-01	9,09E-02	1,08E-02	-9,06E+01
Use of secondary material	kg	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
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of net fresh water	m3	5,13E-02	1,48E-03	3,78E-03	3,89E-02	6,58E-05	5,70E-05	1,06E-04	-1,33E-02

Table 27: Other environmental information describing waste categories - RPM-K, DN 200 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Hazardous waste	kg	1,73E-02	1,94E-04	3,17E-05	6,45E-02	1,41E-05	2,82E-03	2,53E-07	-2,23E-03
Non-hazardous waste disposed	kg	6,34E+00	3,85E-01	1,11E-02	5,22E+00	2,80E-02	8,03E-03	4,01E-02	-3,25E+00
Radioactive waste disposed/stored	kg	3,60E-04	2,55E-06	2,45E-09	5,31E-03	1,85E-07	8,54E-08	3,23E-09	-9,60E-05

Table 28: Environmental information describing output flows - RPM-K, DN 200 mm, with the actuator

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	7,80E-02	0	0	4,24E+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	7,76E-02	0	0
Exported energy, heat	MJ	0	0	0	0	0	1,52E-01	0	0

Table 29: Core environmental impact indicators - RPM-K, DN 400 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Climate change - Fossil	kg CO2 eq	2,65E+01	8,31E-01	1,66E-03	0	6,06E-02	4,38E-02	9,37E-04	-1,56E+01
Climate change - Biogenic	kg CO2 eq	1,60E-01	7,62E-04	1,49E-02	0	5,55E-05	5,99E-06	5,96E-06	-4,09E-02
Climate change - Land use and LU change	kg CO2 eq	1,20E-01	4,10E-04	1,95E-07	0	2,99E-05	2,19E-07	6,82E-07	-9,83E-02
Climate change	kg CO2 eq	2,68E+01	8,33E-01	1,66E-02	0	6,07E-02	4,38E-02	9,44E-04	-1,57E+01
GWP-GHG	kg CO2 eq	2,66E+01	8,32E-01	4,69E-03	0	6,06E-02	4,38E-02	9,40E-04	-1,56E+01
Ozone depletion	kg CFC11 eq	5,80E-07	1,81E-08	1,38E-11	0	1,32E-09	4,90E-11	2,21E-11	-2,99E-07
Acidification	mol H+ eq	2,67E-01	1,82E-03	5,04E-06	0	1,32E-04	9,53E-06	6,67E-06	-8,48E-02
Eutrophication, freshwater*	kg P eq	1,38E-02	5,91E-05	2,56E-07	0	4,31E-06	9,50E-08	2,46E-07	-7,39E-03
Eutrophication, marine	kg N eq	3,35E-02	4,59E-04	1,59E-05	0	3,34E-05	5,60E-06	2,50E-06	-1,60E-02
Eutrophication, terrestrial	mol N eq	8,81E-01	4,66E-03	2,42E-05	0	3,40E-04	4,75E-05	2,67E-05	-1,61E-01
Photochemical ozone formation	kg NMVOC eq	1,17E-01	2,82E-03	9,47E-06	0	2,06E-04	1,19E-05	9,03E-06	-6,92E-02
Resource use, minerals and metals*	kg Sb eq	5,47E-04	2,72E-06	1,29E-09	0	1,98E-07	1,63E-09	1,90E-09	-8,19E-05
Resource use, fossils*	MJ	3,33E+02	1,18E+01	9,64E-03	0	8,61E-01	6,44E-03	2,03E-02	-1,76E+02
Water use*	m ³ depriv.	2,71E+00	4,87E-02	-5,41E-05	0	3,55E-03	2,32E-04	8,60E-04	-4,93E-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 30: Additional environmental impact indicators - RPM-K, DN 400 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Particulate matter	disease inc.	3,28E-06	6,20E-08	1,11E-10	0	4,52E-09	4,24E-11	1,44E-10	-1,31E-06
Human toxicity, non-cancer*	CTUh	6,18E-07	8,38E-09	3,64E-11	0	6,11E-10	1,04E-10	5,87E-12	-3,73E-07
Human toxicity, cancer*	CTUh	1,24E-07	3,79E-10	5,40E-12	0	2,76E-11	2,46E-12	5,24E-13	-9,73E-08
Land use*	Pt	8,03E+01	7,14E+00	1,80E-02	0	5,20E-01	1,79E-03	4,64E-02	-4,21E+01
Ionising radiation**	kBq U-235 eq	2,53E+00	1,60E-02	1,60E-05	0	1,17E-03	2,23E-05	2,68E-05	-9,77E-01
Ecotoxicity, freshwater	CTUe	2,49E+02	5,84E+00	6,69E-02	0	4,26E-01	9,33E-02	8,90E-03	-7,59E+01

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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 31: Parameters describing resource use - RPM-K, DN 400 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Use of renewable primary energy excl. raw materials	MJ, net calorific value	4,63E+01	1,86E-01	2,50E-04	0	1,35E-02	3,77E-04	3,49E-04	-3,28E+01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	4,63E+01	1,86E-01	2,50E-04	0	1,35E-02	3,77E-04	3,49E-04	-3,28E+01
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	3,55E+02	1,26E+01	1,03E-02	0	9,15E-01	6,98E-03	2,16E-02	-1,86E+02
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	3,55E+02	1,26E+01	1,03E-02	0	9,15E-01	6,98E-03	2,16E-02	-1,86E+02
Use of secondary material	kg	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
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of net fresh water	m3	7,82E-02	2,26E-03	5,77E-03	0	1,00E-04	8,70E-05	1,62E-04	-2,03E-02

Table 32: Other environmental information describing waste categories - RPM-K, DN 400 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Hazardous waste	kg	2,00E-02	2,96E-04	4,83E-05	0	2,16E-05	4,93E-04	5,05E-07	-4,47E-03
Non-hazardous waste disposed	kg	1,01E+01	5,87E-01	1,69E-02	0	4,28E-02	6,03E-04	8,02E-02	-6,08E+00
Radioactive waste disposed/stored	kg	6,30E-04	3,88E-06	3,74E-09	0	2,83E-07	5,53E-09	6,45E-09	-2,49E-04

Table 33: Environmental information describing output flows - RPM-K, DN 400 mm, manual

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	1,19E-01	0	0	6,46E+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	7,24E-02	0	0
Exported energy, heat	MJ	0	0	0	0	0	1,41E-01	0	0

Table 34: Core environmental impact indicators - RPM-K, DN 400 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Climate change - Fossil	kg CO2 eq	2,75E+01	9,37E-01	1,87E-03	5,88E+01	6,82E-02	2,37E-01	9,37E-04	-1,58E+01
Climate change - Biogenic	kg CO2 eq	1,69E-01	8,58E-04	1,68E-02	5,59E-01	6,25E-05	5,99E-06	5,96E-06	-4,13E-02
Climate change - Land use and LU change	kg CO2 eq	1,21E-01	4,62E-04	2,19E-07	7,98E-02	3,37E-05	1,18E-05	6,82E-07	-9,85E-02
Climate change	kg CO2 eq	2,78E+01	9,38E-01	1,86E-02	5,95E+01	6,83E-02	2,36E-01	9,44E-04	-1,59E+01
GWP-GHG	kg CO2 eq	2,76E+01	9,37E-01	5,27E-03	5,89E+01	6,82E-02	2,37E-01	9,40E-04	-1,58E+01
Ozone depletion	kg CFC11 eq	6,09E-07	2,04E-08	1,55E-11	4,22E-07	1,48E-09	3,19E-10	2,21E-11	-3,02E-07
Acidification	mol H+ eq	2,71E-01	2,05E-03	5,67E-06	2,64E-01	1,49E-04	1,29E-04	6,67E-06	-8,57E-02
Eutrophication, freshwater*	kg P eq	1,44E-02	6,66E-05	2,88E-07	9,21E-02	4,85E-06	3,81E-06	2,46E-07	-7,47E-03
Eutrophication, marine	kg N eq	3,48E-02	5,17E-04	1,78E-05	5,73E-02	3,76E-05	4,82E-05	2,50E-06	-1,62E-02
Eutrophication, terrestrial	mol N eq	8,93E-01	5,25E-03	2,72E-05	4,24E-01	3,82E-04	5,46E-04	2,67E-05	-1,64E-01
Photochemical ozone formation	kg NMVOC eq	1,22E-01	3,18E-03	1,06E-05	1,24E-01	2,31E-04	1,11E-04	9,03E-06	-7,02E-02
Resource use, minerals and metals*	kg Sb eq	5,51E-04	3,06E-06	1,45E-09	3,82E-04	2,23E-07	1,31E-07	1,90E-09	-8,32E-05
Resource use, fossils*	MJ	3,47E+02	1,33E+01	1,08E-02	9,51E+02	9,68E-01	1,27E-01	2,03E-02	-1,78E+02
Water use*	m ³ depriv.	2,81E+00	5,49E-02	-6,07E-05	1,01E+01	3,99E-03	6,66E-03	8,60E-04	-4,83E-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 35: Additional environmental impact indicators - RPM-K, DN 400 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Particulate matter	disease inc.	3,34E-06	6,98E-08	1,24E-10	6,35E-07	5,08E-09	1,43E-09	1,44E-10	-1,32E-06
Human toxicity, non-cancer*	CTUh	6,30E-07	9,44E-09	4,09E-11	6,66E-07	6,87E-10	3,11E-09	5,87E-12	-3,76E-07
Human toxicity, cancer*	CTUh	1,26E-07	4,27E-10	6,07E-12	1,95E-08	3,11E-11	3,32E-11	5,24E-13	-9,86E-08
Land use*	Pt	8,33E+01	8,04E+00	2,02E-02	9,87E+01	5,85E-01	2,76E-01	4,64E-02	-4,29E+01
Ionising radiation**	kBq U-235 eq	2,68E+00	1,80E-02	1,80E-05	2,46E+01	1,31E-03	5,22E-04	2,68E-05	-9,83E-01
Ecotoxicity, freshwater	CTUe	2,53E+02	6,58E+00	7,54E-02	2,08E+02	4,79E-01	1,99E+00	8,90E-03	-7,71E+01

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Table 36: Parameters describing resource use - RPM-K, DN 400 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Use of renewable primary energy excl. raw materials	MJ, net calorific value	4,71E+01	2,09E-01	2,82E-04	6,48E+01	1,52E-02	2,38E-02	3,49E-04	-3,30E+01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	4,71E+01	2,09E-01	2,82E-04	6,48E+01	1,52E-02	2,38E-02	3,49E-04	-3,30E+01
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	3,70E+02	1,41E+01	1,16E-02	1,01E+03	1,03E+00	1,37E-01	2,16E-02	-1,88E+02
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	3,70E+02	1,41E+01	1,16E-02	1,01E+03	1,03E+00	1,37E-01	2,16E-02	-1,88E+02
Use of secondary material	kg	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
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of net fresh water	m3	8,80E-02	2,54E-03	6,49E-03	6,67E-02	1,13E-04	9,78E-05	1,82E-04	-2,29E-02

Table 37: Other environmental information describing waste categories - RPM-K, DN 400 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Hazardous waste	kg	2,07E-02	3,33E-04	5,42E-05	7,17E-02	2,42E-05	4,06E-03	5,05E-07	-4,53E-03
Non-hazardous waste disposed	kg	1,04E+01	6,61E-01	1,91E-02	5,80E+00	4,81E-02	1,21E-02	8,02E-02	-6,17E+00
Radioactive waste disposed/stored	kg	6,66E-04	4,37E-06	4,21E-09	5,90E-03	3,18E-07	1,29E-07	6,45E-09	-2,51E-04

Table 38: Environmental information describing output flows - RPM-K, DN 400 mm, with the actuator

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	1,34E-01	0	0	7,28E+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	7,24E-02	0	0
Exported energy, heat	MJ	0	0	0	0	0	1,41E-01	0	0

Table 39: Core environmental impact indicators - RPMC-K, 200x100 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Climate change - Fossil	kg CO2 eq	1,46E+01	4,19E-01	1,06E-03	0	3,88E-02	4,12E-03	2,04E-05	-8,04E+00
Climate change - Biogenic	kg CO2 eq	9,47E-02	3,84E-04	9,54E-03	0	3,55E-05	5,63E-07	1,30E-07	-1,83E-02
Climate change - Land use and LU change	kg CO2 eq	2,71E-02	2,07E-04	1,25E-07	0	1,92E-05	2,06E-08	1,48E-08	-1,82E-02
Climate change	kg CO2 eq	1,47E+01	4,20E-01	1,06E-02	0	3,89E-02	4,12E-03	2,05E-05	-8,08E+00
GWP-GHG	kg CO2 eq	1,47E+01	4,20E-01	3,00E-03	0	3,88E-02	4,12E-03	2,04E-05	-8,05E+00
Ozone depletion	kg CFC11 eq	3,22E-07	9,13E-09	8,80E-12	0	8,45E-10	4,61E-12	4,82E-13	-1,44E-07
Acidification	mol H+ eq	1,61E-01	9,17E-04	3,22E-06	0	8,48E-05	8,96E-07	1,45E-07	-3,85E-02
Eutrophication, freshwater*	kg P eq	7,93E-03	2,98E-05	1,64E-07	0	2,76E-06	8,94E-09	5,34E-09	-3,89E-03
Eutrophication, marine	kg N eq	1,95E-02	2,31E-04	1,01E-05	0	2,14E-05	5,27E-07	5,43E-08	-8,31E-03
Eutrophication, terrestrial	mol N eq	5,78E-01	2,35E-03	1,55E-05	0	2,17E-04	4,47E-06	5,81E-07	-8,42E-02
Photochemical ozone formation	kg NMVOC eq	6,70E-02	1,42E-03	6,05E-06	0	1,32E-04	1,12E-06	1,96E-07	-3,76E-02
Resource use, minerals and metals*	kg Sb eq	3,70E-04	1,37E-06	8,25E-10	0	1,27E-07	1,53E-10	4,14E-11	-5,34E-05
Resource use, fossils*	MJ	1,80E+02	5,96E+00	6,16E-03	0	5,51E-01	6,06E-04	4,41E-04	-8,66E+01
Water use*	m³ depriv.	8,86E-01	2,46E-02	-3,46E-05	0	2,27E-03	2,19E-05	1,87E-05	3,49E-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 40: Additional environmental impact indicators - RPMC-K, 200x100 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Particulate matter	disease inc.	2,00E-06	3,13E-08	7,07E-11	0	2,89E-09	3,99E-12	3,13E-12	-6,92E-07
Human toxicity, non-cancer*	CTUh	3,41E-07	4,23E-09	2,33E-11	0	3,91E-10	9,81E-12	1,28E-13	-1,85E-07
Human toxicity, cancer*	CTUh	7,80E-08	1,91E-10	3,46E-12	0	1,77E-11	2,32E-13	1,14E-14	-6,07E-08
Land use*	Pt	4,92E+01	3,60E+00	1,15E-02	0	3,33E-01	1,69E-04	1,01E-03	-2,62E+01
Ionising radiation**	kBq U-235 eq	1,29E+00	8,06E-03	1,02E-05	0	7,46E-04	2,10E-06	5,82E-07	-3,30E-01
Ecotoxicity, freshwater	CTUe	1,58E+02	2,94E+00	4,27E-02	0	2,72E-01	8,78E-03	1,93E-04	-4,36E+01

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Table 41: Parameters describing resource use - RPMC-K, 200x100 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Use of renewable primary energy excl. raw materials	MJ, net calorific value	1,73E+01	9,36E-02	1,60E-04	0	8,66E-03	3,54E-05	7,58E-06	-1,03E+01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	1,73E+01	9,36E-02	1,60E-04	0	8,66E-03	3,54E-05	7,58E-06	-1,03E+01
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	1,92E+02	6,33E+00	6,57E-03	0	5,86E-01	6,57E-04	4,70E-04	-9,18E+01
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	1,92E+02	6,33E+00	6,57E-03	0	5,86E-01	6,57E-04	4,70E-04	-9,18E+01
Use of secondary material	kg	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
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of net fresh water	m3	5,00E-02	1,44E-03	3,69E-03	0	6,41E-05	5,56E-05	1,03E-04	-1,30E-02

Table 42: Other environmental information describing waste categories - RPMC-K, 200x100 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Hazardous waste	kg	1,26E-02	1,49E-04	3,09E-05	0	1,38E-05	4,64E-05	1,10E-08	-2,28E-03
Non-hazardous waste disposed	kg	5,75E+00	2,96E-01	1,08E-02	0	2,74E-02	5,67E-05	1,74E-03	-3,45E+00
Radioactive waste disposed/stored	kg	3,18E-04	1,96E-06	2,39E-09	0	1,81E-07	5,20E-10	1,40E-10	-8,30E-05

Table 43: Environmental information describing output flows - RPMC-K, 200x100 mm, manual

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	7,61E-02	0	0	4,19E+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	6,82E-03	0	0
Exported energy, heat	MJ	0	0	0	0	0	1,33E-02	0	0

Table 44: Core environmental impact indicators - RPMC-K, 200x100 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Climate change - Fossil	kg CO2 eq	1,53E+01	1,12E+01	1,20E-03	1,12E+01	4,36E-02	1,27E-01	1,45E-05	-8,18E+00
Climate change - Biogenic	kg CO2 eq	1,01E-01	1,06E-01	1,08E-02	1,06E-01	3,99E-05	5,63E-07	9,24E-08	-1,86E-02
Climate change - Land use and LU change	kg CO2 eq	2,78E-02	1,52E-02	1,40E-07	1,52E-02	2,15E-05	7,48E-06	1,06E-08	-1,83E-02
Climate change	kg CO2 eq	1,54E+01	1,13E+01	1,20E-02	1,13E+01	4,37E-02	1,27E-01	1,46E-05	-8,21E+00
GWP-GHG	kg CO2 eq	1,47E+01	4,20E-01	3,00E-03	0,00E+00	3,88E-02	4,12E-03	2,04E-05	-8,05E+00
Ozone depletion	kg CFC11 eq	3,38E-07	8,02E-08	9,93E-12	8,02E-08	9,50E-10	1,77E-10	3,43E-13	-1,47E-07
Acidification	mol H+ eq	1,64E-01	5,01E-02	3,64E-06	5,01E-02	9,53E-05	7,77E-05	1,03E-07	-3,91E-02
Eutrophication, freshwater*	kg P eq	8,33E-03	1,75E-02	1,85E-07	1,75E-02	3,10E-06	2,40E-06	3,81E-09	-3,94E-03
Eutrophication, marine	kg N eq	2,03E-02	1,09E-02	1,14E-05	1,09E-02	2,40E-05	2,78E-05	3,87E-08	-8,48E-03
Eutrophication, terrestrial	mol N eq	5,86E-01	8,06E-02	1,75E-05	8,06E-02	2,44E-04	3,24E-04	4,14E-07	-8,59E-02
Photochemical ozone formation	kg NMVOC eq	7,01E-02	2,37E-02	6,83E-06	2,37E-02	1,48E-04	6,43E-05	1,40E-07	-3,83E-02
Resource use, minerals and metals*	kg Sb eq	3,73E-04	7,26E-05	9,31E-10	7,26E-05	1,43E-07	8,34E-08	2,95E-11	-5,43E-05
Resource use, fossils*	MJ	1,90E+02	1,81E+02	6,96E-03	1,81E+02	6,19E-01	7,83E-02	3,15E-04	-8,81E+01
Water use*	m³ depriv.	9,53E-01	1,92E+00	-3,89E-05	1,92E+00	2,55E-03	4,15E-03	1,33E-05	3,56E-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 45: Additional environmental impact indicators - RPMC-K, 200x100 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Particulate matter	disease inc.	2,05E-06	1,21E-07	7,97E-11	1,21E-07	3,25E-09	8,96E-10	2,23E-12	-7,04E-07
Human toxicity, non-cancer*	CTUh	3,49E-07	1,27E-07	2,62E-11	1,27E-07	4,39E-10	1,94E-09	9,10E-14	-1,88E-07
Human toxicity, cancer*	CTUh	7,94E-08	3,72E-09	3,90E-12	3,72E-09	1,99E-11	1,99E-11	8,11E-15	-6,17E-08
Land use*	Pt	5,19E+01	1,88E+01	1,30E-02	1,88E+01	3,74E-01	1,77E-01	7,19E-04	-2,68E+01
Ionising radiation**	kBq U-235 eq	1,38E+00	4,68E+00	1,16E-05	4,68E+00	8,38E-04	3,23E-04	4,15E-07	-3,34E-01
Ecotoxicity, freshwater	CTUe	1,61E+02	3,96E+01	4,84E-02	3,96E+01	3,06E-01	1,22E+00	1,38E-04	-4,45E+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 46: Parameters describing resource use - RPMC-K, 200x100 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Use of renewable primary energy excl. raw materials	MJ, net calorific value	1,78E+01	1,23E+01	1,81E-04	1,23E+01	9,73E-03	1,51E-02	5,40E-06	-1,04E+01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	1,78E+01	1,23E+01	1,81E-04	1,23E+01	9,73E-03	1,51E-02	5,40E-06	-1,04E+01
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	2,03E+02	1,92E+02	7,41E-03	1,92E+02	6,58E-01	8,39E-02	3,35E-04	-9,33E+01
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	2,03E+02	1,92E+02	7,41E-03	1,92E+02	6,58E-01	8,39E-02	3,35E-04	-9,33E+01
Use of secondary material	kg	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
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of net fresh water	m3	5,64E-02	1,63E-03	4,16E-03	4,27E-02	7,23E-05	6,27E-05	1,17E-04	-1,46E-02

Table 47: Other environmental information describing waste categories - RPMC-K, 200x100 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Hazardous waste	kg	1,31E-02	1,36E-02	3,48E-05	1,36E-02	1,55E-05	2,33E-03	7,83E-09	-2,32E-03
Non-hazardous waste disposed	kg	6,04E+00	1,10E+00	1,22E-02	1,10E+00	3,08E-02	7,43E-03	1,24E-03	-3,52E+00
Radioactive waste disposed/stored	kg	3,40E-04	1,12E-03	2,70E-09	1,12E-03	2,04E-07	7,99E-08	1,00E-10	-8,40E-05

Table 48: Environmental information describing output flows - RPMC-K, 200x100 mm, with the actuator

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	8,58E-02	0	0	4,72E+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	4,86E-03	0	0
Exported energy, heat	MJ	0	0	0	0	0	9,50E-03	0	0

Table 49: Core environmental impact indicators - RPMC-K, 300x300 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Climate change - Fossil	kg CO2 eq	2,55E+01	6,69E-01	1,69E-03	0	6,17E-02	7,01E-03	3,47E-05	-1,47E+01
Climate change - Biogenic	kg CO2 eq	1,59E-01	6,13E-04	1,52E-02	0	5,65E-05	9,58E-07	2,21E-07	-3,67E-02
Climate change - Land use and LU change	kg CO2 eq	8,99E-02	3,30E-04	1,98E-07	0	3,05E-05	3,50E-08	2,52E-08	-7,10E-02
Climate change	kg CO2 eq	2,57E+01	6,70E-01	1,68E-02	0	6,18E-02	7,02E-03	3,49E-05	-1,48E+01
GWP-GHG	kg CO2 eq	2,56E+01	6,69E-01	4,77E-03	0	6,17E-02	7,01E-03	3,48E-05	-1,47E+01
Ozone depletion	kg CFC11 eq	5,61E-07	1,46E-08	1,40E-11	0	1,34E-09	7,85E-12	8,19E-13	-2,75E-07
Acidification	mol H+ eq	2,67E-01	1,46E-03	5,12E-06	0	1,35E-04	1,52E-06	2,47E-07	-7,65E-02
Eutrophication, freshwater*	kg P eq	1,35E-02	4,75E-05	2,60E-07	0	4,39E-06	1,52E-08	9,09E-09	-7,01E-03
Eutrophication, marine	kg N eq	3,30E-02	3,69E-04	1,61E-05	0	3,40E-05	8,97E-07	9,23E-08	-1,51E-02
Eutrophication, terrestrial	mol N eq	9,16E-01	3,75E-03	2,46E-05	0	3,46E-04	7,60E-06	9,88E-07	-1,53E-01
Photochemical ozone formation	kg NMVOC eq	1,14E-01	2,27E-03	9,63E-06	0	2,09E-04	1,90E-06	3,34E-07	-6,66E-02
Resource use, minerals and metals*	kg Sb eq	5,75E-04	2,19E-06	1,31E-09	0	2,02E-07	2,61E-10	7,04E-11	-8,49E-05
Resource use, fossils*	MJ	3,15E+02	9,50E+00	9,81E-03	0	8,76E-01	1,03E-03	7,51E-04	-1,63E+02
Water use*	m³ depriv.	2,11E+00	3,92E-02	-5,49E-05	0	3,61E-03	3,72E-05	3,18E-05	-5,88E-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 50: Additional environmental impact indicators - RPMC-K, 300x300 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Particulate matter	disease inc.	3,30E-06	4,98E-08	1,12E-10	0	4,60E-09	6,79E-12	5,32E-12	-1,25E-06
Human toxicity, non-cancer*	CTUh	5,98E-07	6,74E-09	3,70E-11	0	6,22E-10	1,67E-11	2,17E-13	-3,47E-07
Human toxicity, cancer*	CTUh	1,27E-07	3,05E-10	5,49E-12	0	2,81E-11	3,94E-13	1,94E-14	-9,89E-08
Land use*	Pt	8,05E+01	5,74E+00	1,83E-02	0	5,30E-01	2,87E-04	1,72E-03	-4,27E+01
Ionising radiation**	kBq U-235 eq	2,36E+00	1,29E-02	1,63E-05	0	1,19E-03	3,57E-06	9,91E-07	-8,03E-01
Ecotoxicity, freshwater	CTUe	2,53E+02	4,70E+00	6,81E-02	0	4,33E-01	1,49E-02	3,29E-04	-7,47E+01

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Table 51: Parameters describing resource use - RPMC-K, 300x300 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Use of renewable primary energy excl. raw materials	MJ, net calorific value	3,90E+01	1,49E-01	2,55E-04	0	1,38E-02	6,02E-05	1,29E-05	-2,65E+01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	3,90E+01	1,49E-01	2,55E-04	0	1,38E-02	6,02E-05	1,29E-05	-2,65E+01
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	3,36E+02	1,01E+01	1,04E-02	0	9,32E-01	1,12E-03	7,99E-04	-1,73E+02
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	3,36E+02	1,01E+01	1,04E-02	0	9,32E-01	1,12E-03	7,99E-04	-1,73E+02
Use of secondary material	kg	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
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of net fresh water	m3	7,96E-02	2,30E-03	5,88E-03	0	1,02E-04	8,85E-05	1,65E-04	-2,07E-02

Table 52: Other environmental information describing waste categories - RPMC-K, 300x300 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Hazardous waste	kg	2,03E-02	2,38E-04	4,90E-05	0	2,19E-05	7,89E-05	1,87E-08	-4,20E-03
Non-hazardous waste disposed	kg	9,84E+00	4,72E-01	1,72E-02	0	4,35E-02	9,65E-05	2,97E-03	-5,95E+00
Radioactive waste disposed/stored	kg	5,85E-04	3,12E-06	3,80E-09	0	2,88E-07	8,84E-10	2,39E-10	-2,04E-04

Table 53: Environmental information describing output flows - RPMC-K, 300x300 mm, manual

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	1,21E-01	0	0	6,67E+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	1,16E-02	0	0
Exported energy, heat	MJ	0	0	0	0	0	2,26E-02	0	0

Table 54: Core environmental impact indicators - RPMC-K, 300x300 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Climate change - Fossil	kg CO2 eq	2,96E+01	7,50E-01	1,89E-03	7,86E+00	6,91E-02	1,96E-01	1,45E-05	-1,49E+01
Climate change - Biogenic	kg CO2 eq	1,72E-01	6,87E-04	1,70E-02	7,46E-02	6,33E-05	9,58E-07	9,24E-08	-3,70E-02
Climate change - Land use and LU change	kg CO2 eq	9,66E-02	3,70E-04	2,22E-07	1,07E-02	3,41E-05	1,16E-05	1,06E-08	-7,11E-02
Climate change	kg CO2 eq	2,99E+01	7,51E-01	1,89E-02	7,94E+00	6,92E-02	1,96E-01	1,46E-05	-1,50E+01
GWP-GHG	kg CO2 eq	2,98E+01	7,50E-01	5,34E-03	5,89E+01	6,91E-02	1,96E-01	1,46E-05	-1,49E+01
Ozone depletion	kg CFC11 eq	6,27E-07	1,63E-08	1,57E-11	5,63E-08	1,50E-09	2,73E-10	3,43E-13	-2,78E-07
Acidification	mol H+ eq	3,25E-01	1,64E-03	5,74E-06	3,52E-02	1,51E-04	1,20E-04	1,03E-07	-7,73E-02
Eutrophication, freshwater*	kg P eq	1,82E-02	5,33E-05	2,92E-07	1,23E-02	4,91E-06	3,73E-06	3,81E-09	-7,08E-03
Eutrophication, marine	kg N eq	3,89E-02	4,14E-04	1,81E-05	7,64E-03	3,81E-05	4,30E-05	3,87E-08	-1,54E-02
Eutrophication, terrestrial	mol N eq	9,84E-01	4,20E-03	2,76E-05	5,66E-02	3,87E-04	5,02E-04	4,14E-07	-1,55E-01
Photochemical ozone formation	kg NMVOC eq	1,37E-01	2,55E-03	1,08E-05	1,66E-02	2,34E-04	9,95E-05	1,40E-07	-6,75E-02
Resource use, minerals and metals*	kg Sb eq	1,08E-03	2,45E-06	1,47E-09	5,10E-05	2,26E-07	1,29E-07	2,95E-11	-8,59E-05
Resource use, fossils*	MJ	3,64E+02	1,07E+01	1,10E-02	1,27E+02	9,81E-01	1,21E-01	3,15E-04	-1,65E+02
Water use*	m³ depriv.	3,23E+00	4,39E-02	-6,16E-05	1,35E+00	4,05E-03	6,44E-03	1,33E-05	-5,08E-02

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Table 55: Additional environmental impact indicators - RPMC-K, 300x300 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Particulate matter	disease inc.	3,67E-06	5,59E-08	1,26E-10	8,48E-08	5,15E-09	1,39E-09	2,23E-12	-1,26E-06
Human toxicity, non-cancer*	CTUh	1,17E-06	7,56E-09	4,14E-11	8,90E-08	6,96E-10	3,02E-09	9,10E-14	-3,50E-07
Human toxicity, cancer*	CTUh	1,46E-07	3,42E-10	6,16E-12	2,61E-09	3,15E-11	3,09E-11	8,11E-15	-1,00E-07
Land use*	Pt	1,03E+02	6,44E+00	2,05E-02	1,32E+01	5,93E-01	2,74E-01	7,19E-04	-4,35E+01
Ionising radiation**	kBq U-235 eq	2,65E+00	1,44E-02	1,83E-05	3,28E+00	1,33E-03	5,01E-04	4,15E-07	-8,08E-01
Ecotoxicity, freshwater	CTUe	3,13E+02	5,27E+00	7,62E-02	2,78E+01	4,85E-01	1,90E+00	1,38E-04	-7,57E+01

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Table 56: Parameters describing resource use - RPMC-K, 300x300 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Use of renewable primary energy excl. raw materials	MJ, net calorific value	4,42E+01	1,67E-01	2,85E-04	8,65E+00	1,54E-02	2,35E-02	5,40E-06	-2,67E+01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	4,42E+01	1,67E-01	2,85E-04	8,65E+00	1,54E-02	2,35E-02	5,40E-06	-2,67E+01
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	3,88E+02	1,13E+01	1,17E-02	1,35E+02	1,04E+00	1,30E-01	3,35E-04	-1,75E+02
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	3,88E+02	1,13E+01	1,17E-02	1,35E+02	1,04E+00	1,30E-01	3,35E-04	-1,75E+02
Use of secondary material	kg	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
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of net fresh water	m3	8,93E-02	2,58E-03	6,59E-03	6,77E-02	1,15E-04	9,93E-05	1,85E-04	-2,32E-02

Table 57: Other environmental information describing waste categories - RPMC-K, 300x300 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Hazardous waste	kg	2,94E-02	2,67E-04	5,50E-05	9,57E-03	2,46E-05	3,60E-03	7,83E-09	-4,25E-03
Non-hazardous waste disposed	kg	1,12E+01	5,29E-01	1,93E-02	7,75E-01	4,88E-02	1,15E-02	1,24E-03	-6,04E+00
Radioactive waste disposed/stored	kg	6,59E-04	3,50E-06	4,26E-09	7,88E-04	3,23E-07	1,24E-07	1,00E-10	-2,05E-04

Table 58: Environmental information describing output flows - RPMC-K, 300x300 mm, with the actuator

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	1,36E-01	0	0	7,48E+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	1,16E-02	0	0
Exported energy, heat	MJ	0	0	0	0	0	2,26E-02	0	0

Table 59: Core environmental impact indicators - RPMC-K, 600x600 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Climate change - Fossil	kg CO2 eq	8,95E+01	1,94E+00	4,89E-03	0	1,80E-01	2,32E-02	1,15E-04	-5,66E+01
Climate change - Biogenic	kg CO2 eq	5,26E-01	1,78E-03	4,39E-02	0	1,65E-04	3,17E-06	7,30E-07	-1,62E-01
Climate change - Land use and LU change	kg CO2 eq	6,07E-01	9,58E-04	5,74E-07	0	8,90E-05	1,16E-07	8,36E-08	-5,18E-01
Climate change	kg CO2 eq	9,07E+01	1,94E+00	4,88E-02	0	1,81E-01	2,32E-02	1,16E-04	-5,73E+01
GWP-GHG	kg CO2 eq	8,44E+01	1,80E+00	2,87E-03	0	1,67E-01	2,32E-02	1,03E-04	-5,34E+01
Ozone depletion	kg CFC11 eq	1,96E-06	4,22E-08	4,05E-11	0	3,93E-09	2,60E-11	2,71E-12	-1,13E-06
Acidification	mol H+ eq	8,48E-01	4,24E-03	1,48E-05	0	3,94E-04	5,05E-06	8,17E-07	-3,34E-01
Eutrophication, freshwater*	kg P eq	4,56E-02	1,38E-04	7,55E-07	0	1,28E-05	5,03E-08	3,01E-08	-2,64E-02
Eutrophication, marine	kg N eq	1,09E-01	1,07E-03	4,67E-05	0	9,94E-05	2,97E-06	3,06E-07	-5,79E-02
Eutrophication, terrestrial	mol N eq	2,57E+00	1,09E-02	7,13E-05	0	1,01E-03	2,52E-05	3,27E-06	-5,82E-01
Photochemical ozone formation	kg NMVOC eq	3,84E-01	6,58E-03	2,79E-05	0	6,12E-04	6,30E-06	1,11E-06	-2,42E-01
Resource use, minerals and metals*	kg Sb eq	1,53E-03	6,34E-06	3,80E-09	0	5,89E-07	8,64E-10	2,33E-10	-2,43E-04
Resource use, fossils*	MJ	1,12E+03	2,76E+01	2,84E-02	0	2,56E+00	3,41E-03	2,49E-03	-6,56E+02
Water use*	m³ depriv.	1,13E+01	1,14E-01	-1,59E-04	0	1,06E-02	1,23E-04	1,05E-04	-4,76E+00

* 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 60: Additional environmental impact indicators - RPMC-K, 600x600 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Particulate matter	disease inc.	1,02E-05	1,45E-07	3,25E-10	0	1,34E-08	2,25E-11	1,76E-11	-4,66E-06
Human toxicity, non-cancer*	CTUh	2,13E-06	1,96E-08	1,07E-10	0	1,82E-09	5,52E-11	7,19E-13	-1,39E-06
Human toxicity, cancer*	CTUh	3,85E-07	8,84E-10	1,59E-11	0	8,22E-11	1,31E-12	6,41E-14	-3,02E-07
Land use*	Pt	2,45E+02	1,67E+01	5,29E-02	0	1,55E+00	9,50E-04	5,68E-03	-1,31E+02
Ionising radiation**	kBq U-235 eq	9,09E+00	3,73E-02	4,72E-05	0	3,47E-03	1,18E-05	3,28E-06	-4,39E+00
Ecotoxicity, freshwater	CTUe	7,23E+02	1,36E+01	1,97E-01	0	1,27E+00	4,94E-02	1,09E-03	-2,54E+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.

** 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 61: Parameters describing resource use - RPMC-K, 600x600 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Use of renewable primary energy excl. raw materials	MJ, net calorific value	1,99E+02	4,33E-01	7,37E-04	0	4,03E-02	1,99E-04	4,27E-05	-1,52E+02
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	1,99E+02	4,33E-01	7,37E-04	0	4,03E-02	1,99E-04	4,27E-05	-1,52E+02
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	1,19E+03	2,93E+01	3,03E-02	0	2,72E+00	3,70E-03	2,65E-03	-6,97E+02
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	1,19E+03	2,93E+01	3,03E-02	0	2,72E+00	3,70E-03	2,65E-03	-6,97E+02
Use of secondary material	kg	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
Use of non renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of net fresh water	m3	2,31E-01	6,66E-03	1,70E-02	0	2,96E-04	2,56E-04	4,77E-04	-5,99E-02

Table 62: Other environmental information describing waste categories - RPMC-K, 600x600 mm, manual

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Hazardous waste	kg	6,01E-02	6,90E-04	1,42E-04	0	6,41E-05	2,61E-04	6,19E-08	-1,63E-02
Non-hazardous waste disposed	kg	3,36E+01	1,37E+00	4,98E-02	0	1,27E-01	3,19E-04	9,82E-03	-2,06E+01
Radioactive waste disposed/stored	kg	2,28E-03	9,06E-06	1,10E-08	0	8,42E-07	2,93E-09	7,90E-10	-1,12E-03

Table 63: Environmental information describing output flows - RPMC-K, 600x600 mm, manual

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	3,51E-01	0	0	1,93E+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	3,84E-02	0	0
Exported energy, heat	MJ	0	0	0	0	0	7,51E-02	0	0

Table 64: Core environmental impact indicators - RPMC-K, 600x600 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Climate change - Fossil	kg CO2 eq	9,07E+01	1,95E+00	4,90E-03	2,74E+00	1,78E-01	4,73E-01	1,03E-04	-5,14E+01
Climate change - Biogenic	kg CO2 eq	5,06E-01	1,78E-03	4,40E-02	2,60E-02	1,63E-04	3,17E-06	6,57E-07	-1,47E-01
Climate change - Land use and LU change	kg CO2 eq	5,63E-01	9,61E-04	5,74E-07	3,71E-03	8,78E-05	2,73E-05	7,52E-08	-4,67E-01
Climate change	kg CO2 eq	9,17E+01	1,95E+00	4,89E-02	2,77E+00	1,78E-01	4,72E-01	1,04E-04	-5,20E+01
GWP-GHG	kg CO2 eq	9,11E+01	1,95E+00	1,38E-02	5,30E+01	1,78E-01	4,73E-01	1,04E-04	-5,15E+01
Ozone depletion	kg CFC11 eq	1,93E-06	4,24E-08	4,06E-11	1,96E-08	3,87E-09	6,56E-10	2,44E-12	-1,03E-06
Acidification	mol H+ eq	9,02E-01	4,25E-03	1,49E-05	1,23E-02	3,89E-04	2,85E-04	7,35E-07	-3,03E-01
Eutrophication, freshwater*	kg P eq	5,23E-02	1,38E-04	7,56E-07	4,29E-03	1,26E-05	8,76E-06	2,71E-08	-2,39E-02
Eutrophication, marine	kg N eq	1,13E-01	1,07E-03	4,67E-05	2,66E-03	9,81E-05	1,03E-04	2,75E-07	-5,27E-02
Eutrophication, terrestrial	mol N eq	2,48E+00	1,09E-02	7,14E-05	1,97E-02	9,97E-04	1,19E-03	2,94E-06	-5,29E-01
Photochemical ozone formation	kg NMVOC eq	4,01E-01	6,60E-03	2,79E-05	5,79E-03	6,04E-04	2,37E-04	9,95E-07	-2,20E-01
Resource use, minerals and metals*	kg Sb eq	2,58E-03	6,36E-06	3,81E-09	1,78E-05	5,82E-07	3,04E-07	2,10E-10	-2,21E-04
Resource use, fossils*	MJ	1,12E+03	2,76E+01	2,84E-02	4,42E+01	2,53E+00	2,86E-01	2,24E-03	-5,95E+02
Water use*	m ³ depriv.	1,28E+01	1,14E-01	-1,60E-04	4,70E-01	1,04E-02	1,52E-02	9,48E-05	-4,26E+00

* 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 65: Additional environmental impact indicators - RPMC-K, 600x600 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Particulate matter	disease inc.	1,01E-05	1,45E-07	3,26E-10	2,96E-08	1,33E-08	3,27E-09	1,58E-11	-4,23E-06
Human toxicity, non-cancer*	CTUh	3,25E-06	1,96E-08	1,07E-10	3,10E-08	1,79E-09	7,10E-09	6,47E-13	-1,26E-06
Human toxicity, cancer*	CTUh	3,92E-07	8,87E-10	1,59E-11	9,09E-10	8,11E-11	7,31E-11	5,77E-14	-2,74E-07
Land use*	Pt	2,73E+02	1,67E+01	5,30E-02	4,59E+00	1,53E+00	6,43E-01	5,11E-03	-1,20E+02
Ionising radiation**	kBq U-235 eq	8,96E+00	3,74E-02	4,73E-05	1,14E+00	3,42E-03	1,18E-03	2,95E-06	-3,96E+00
Ecotoxicity, freshwater	CTUe	7,95E+02	1,37E+01	1,97E-01	9,70E+00	1,25E+00	4,48E+00	9,81E-04	-2,31E+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.

** 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 66: Parameters describing resource use - RPMC-K, 600x600 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Use of renewable primary energy excl. raw materials	MJ, net calorific value	1,92E+02	4,34E-01	7,38E-04	3,02E+00	3,97E-02	5,51E-02	3,84E-05	-1,37E+02
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	1,92E+02	4,34E-01	7,38E-04	3,02E+00	3,97E-02	5,51E-02	3,84E-05	-1,37E+02
Use of non-renewable primary energy excl. raw materials	MJ, net calorific value	1,20E+03	2,94E+01	3,03E-02	4,69E+01	2,69E+00	3,07E-01	2,38E-03	-6,32E+02
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0,00E+00	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	1,20E+03	2,94E+01	3,03E-02	4,69E+01	2,69E+00	3,07E-01	2,38E-03	-6,32E+02
Use of secondary material	kg	0,00E+00	0	0	0	0	0	0	0
Use of renewable secondary fuels	MJ, net calorific value	0,00E+00	0	0	0	0	0	0	0
Use of non renewable secondary fuels	MJ, net calorific value	0,00E+00	0	0	0	0	0	0	0
Use of net fresh water	m3	2,56E-01	7,40E-03	1,89E-02	1,94E-01	3,29E-04	2,85E-04	5,30E-04	-6,66E-02

Table 67: Other environmental information describing waste categories - RPMC-K, 600x600 mm, with the actuator

Impact category	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Hazardous waste	kg	7,57E-02	6,92E-04	1,42E-04	3,34E-03	6,33E-05	8,59E-03	5,57E-08	-1,48E-02
Non-hazardous waste disposed	kg	3,36E+01	1,37E+00	4,98E-02	2,70E-01	1,26E-01	2,72E-02	8,84E-03	-1,87E+01
Radioactive waste disposed/stored	kg	2,24E-03	9,08E-06	1,10E-08	2,75E-04	8,31E-07	2,92E-07	7,11E-10	-1,02E-03

Table 68: Environmental information describing output flows - RPMC-K, 600x600 mm, with the actuator

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	3,90E-01	0	0	2,15E+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	3,84E-02	0	0
Exported energy, heat	MJ	0	0	0	0	0	7,51E-02	0	0

Table 69: Information describing the biogenic carbon content - RPM-K

Biogenic carbon content per 1 pc of RPM-K	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), DN 80 mm, manual	kg C	2,05E-02
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), DN 80 mm, with the actuator	kg C	2,60E-02
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), DN 200 mm, manual	kg C	3,69E-02
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), DN 200 mm, with the actuator	kg C	4,23E-02
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), DN 400 mm, manual	kg C	6,43E-02
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), DN 400 mm, with the actuator	kg C	7,26E-02
<i>NOTE: 1 kg biogenic carbon is equivalent to 44/12 kg of CO₂</i>		

Table 70: Informace o obsahu biogenního uhlíku - RPMC-K

Biogenic carbon content per 1 pc of RPMC-K	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), 200x100 mm, manual	kg C	4,12E-02
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), 200x100 mm, with the actuator	kg C	4,65E-02
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), 300x300 mm, manual	kg C	6,55E-02
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), 300x300 mm, with the actuator	kg C	7,38E-02
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), 600x600 mm, manual	kg C	1,90E-01
Biogenic carbon content in accompanying packaging (cardboard and packaging wood), 600x600 mm, with the actuator	kg C	2,11E-01
<i>NOTE: 1 kg biogenic carbon is equivalent to 44/12 kg of CO₂</i>		

ADDITIONAL ENVIRONMENTAL INFORMATION

EMS

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

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.



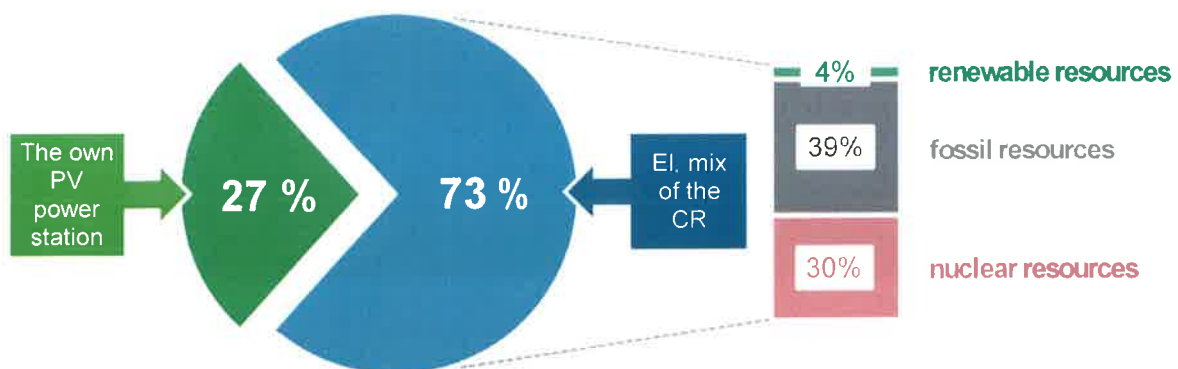
Waste of electrical equipment

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 in 2022. More than a quarter 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 CO₂ eq/kWh,
 for the company's mix: 0,516 kg CO₂ 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



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